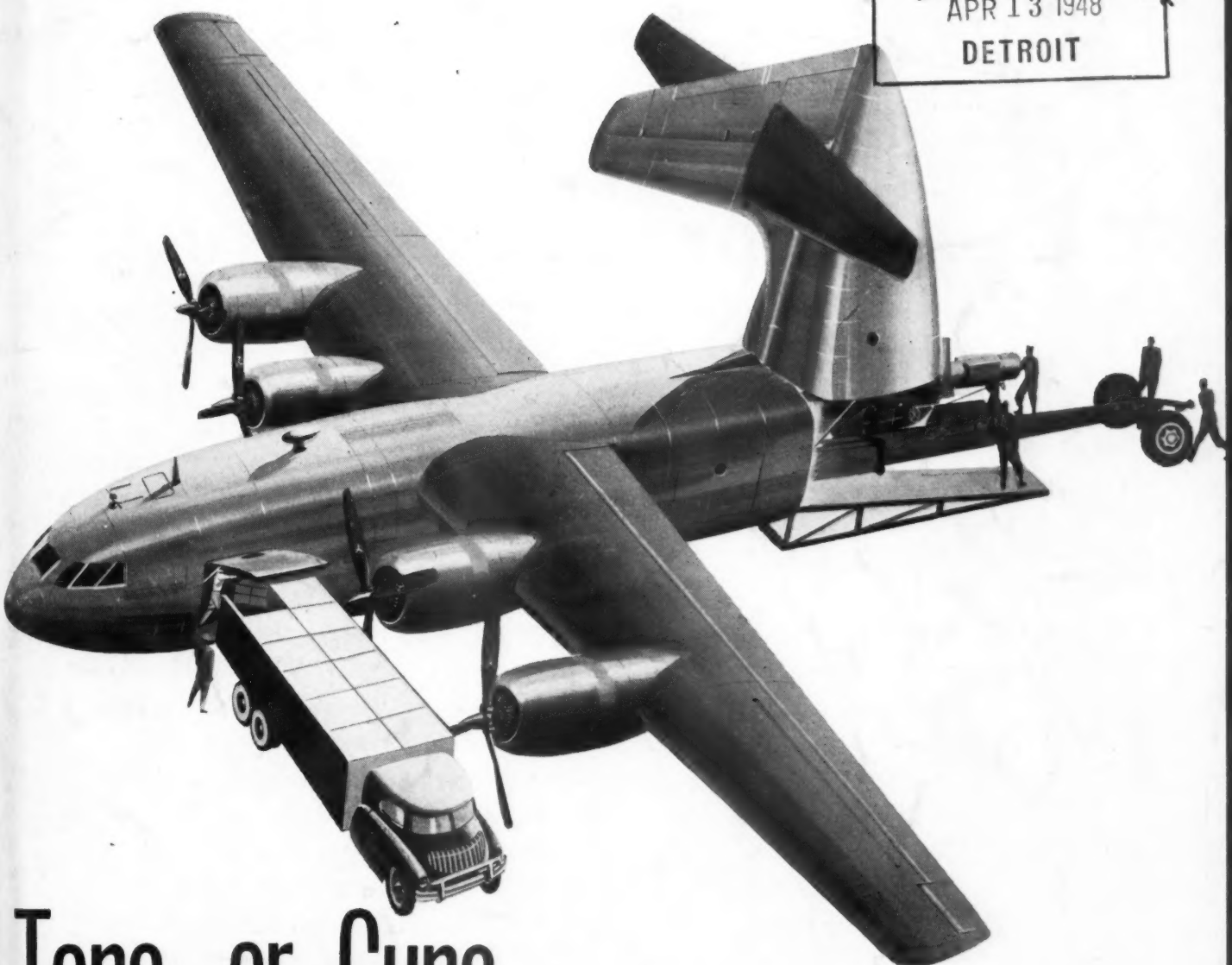
...AIR FORCE DEPARTMENT

AVIATION WEEK

A McGRAW-HILL PUBLICATION

APRIL 12, 1948

PUBLIC LIBRARY
APR 13 1948
DETROIT



Tons...or Guns

The Curtiss-Wright CW-32...pacemaker for versatility, speed and economy in military equipment and commercial cargo transport...America's only airplane designed for immediate adaptability to cargo and materiel transport.

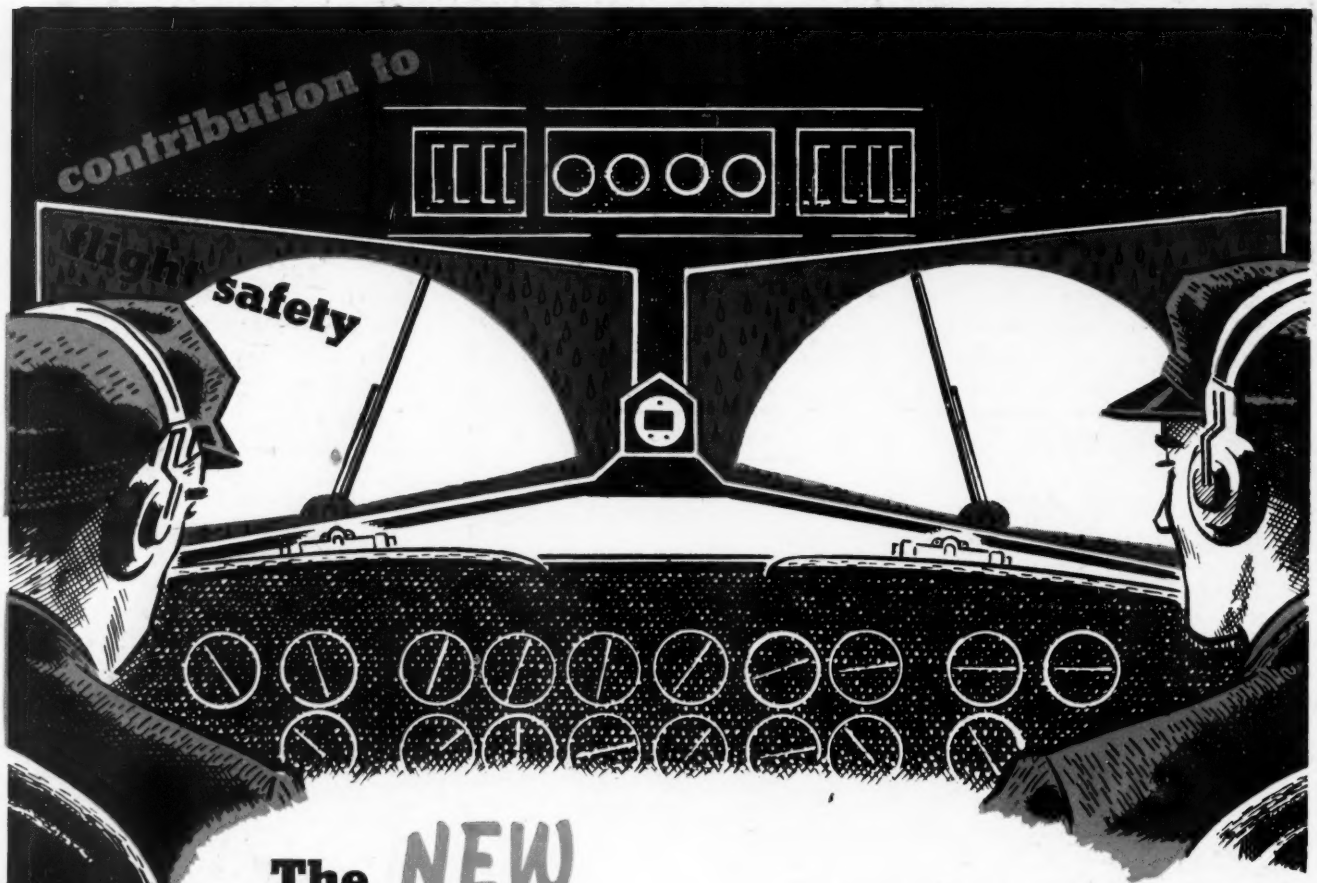
FIRST IN FLIGHT

CURTISS [illegible]

Airplane [illegible]

COLUMBUS,

DETROIT PUB LIBRARY
TECHNOLOGY DPT
96 PUTNAM AV
DETROIT MICH



The NEW Marquette Model 3V Wiper

This new windshield wiper incorporates every feature that is desirable and practical, based on thousands of installations on military, naval and commercial aircraft. It is the result of more than ten years of experience in this highly specialized field.

Blades are synchronized at all times. Obstruction in path of blade will not stall it. Blades may wipe in same or opposed direction. Blades are parked and locked when wiper is not in use. Universal drive arm and tie rod require minimum stock of parts. Wiper blades are easily replaced. Pressure is removed from system when not in operation. Motor unit may be located at any position in the airplane. Stroke on each window can be varied. Hydraulic tubing eliminates linkage control and provides additional space for mounting other instruments. Motor unit and window units are universal, providing maximum interchangeability of parts. Constant torque values through entire stroke. Uniform stroke at all speeds. Simplicity of design, resulting in lower first cost and reduced maintenance expense.

The Marquette METAL PRODUCTS CO.

CLEVELAND 10, OHIO

SUBSIDIARY OF CURTISS-WRIGHT CORPORATION

Manufacturers of: HYDRAULIC, ELECTRIC AND AIR PRESSURE WINDSHIELD WIPERS
HYDRAULIC GOVERNORS FOR DIESEL ENGINES • ROLLER BEARING TEXTILE SPINDLES
FUEL OIL PUMPS • AIR COMPRESSORS • PRECISION PARTS AND ASSEMBLIES

Where an engine fire makes flying SAFER!

Yes, the flames bursting from the rear engine of *this* plane are pointing the way to greater safety in air transportation.

These B-26 power plants are an integral part of Kidde's aviation research facilities—a laboratory where over 1600 engine fires have been deliberately started—to test the effectiveness of different types of extinguishing agents and equipment. Here Kidde—long recognized as the leader in the application of carbon dioxide (CO_2) to airplane fire protection—compares the established merits of this time-tested extinguishing agent with the advantages of the newer chemicals entering the fire-extinguishing field.

Through research like this, Kidde has collected—and evaluated—a *unique* fund of information on airplane fire extinguishing. This information is always at the disposal of government agencies, aircraft manufacturers and transport companies.

WALTER KIDDE & COMPANY, INC. 418 MAIN STREET, BELLEVILLE 9, N. J.

The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

FIRE EXTINGUISHING EQUIPMENT
FIRE DETECTION DEVICES
HIGH-PRESSURE CONTAINERS

Kidde
MANUFACTURING ENGINEERS

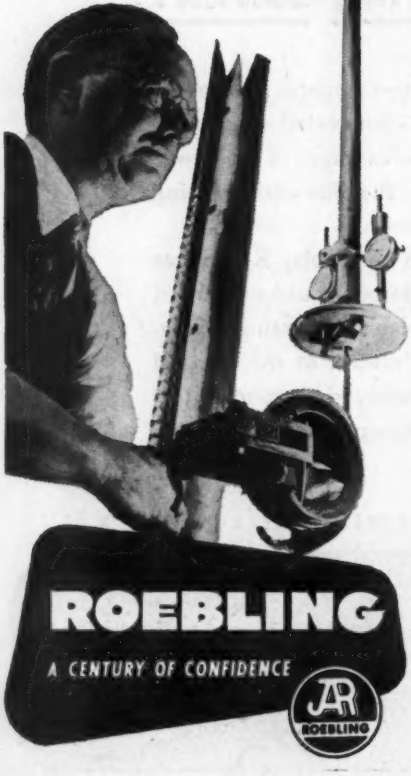
VALVES, CYLINDERS, SPHERES
TEXTILE MACHINERY
AVIATION SAFETY DEVICES

AIRCORD HAS LESS STRETCH

IT'S A BIG STEP FORWARD when you adopt Roebling Aircord. Troublesome "constructional stretch" has been practically eliminated in this modern cord... it gives you dependable uniformity of control and nearly abolishes the need for take-ups.

Roebling Preformed Aircord is available in all required sizes, and can be furnished complete with swaged terminals, proof-tested and ready for installation. A Roebling Field Man will be glad to help you choose the *right* control cord or complete assemblies for your own applications. Write or call him at your nearest Roebling branch office.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities



ROEBLING
A CENTURY OF CONFIDENCE
JAR ROEBLING

Vol. 48 No. 15

AVIATION WEEK

April 12, 1948

Aviation Week	7	Sales & Service	32
News Digest	8	Briefing for Dealers	36
Headline News	11	Letters	38
Aviation Calendar	16	World News	39
Industry Observer	16	Financial	40
Engineering-Production	17	Transport	41
New Products	30	Editorial	54

Robert H. Wood
EDITOR

Merlin H. Mickel
MANAGING EDITOR

Robert B. Hotz ..... News Editor
Irving Stone ..... Technical Editor
William Kroger ..... Manufacturing
Alexander McSurely ..... Sales & Service
Charles L. Adams ..... Transport Editor
Robert McLarren ..... Engineering
Scholer Bangs ..... Pacific Coast Editor
Katherine Johnsen ..... Congress
Stanley L. Colbert ..... Production Editor
Marie Adams ..... Editorial Assistant
Anita Scaffo ..... Editorial Assistant
Victoria Giaculli ..... Editorial Makeup

Executive and Editorial Offices: 330 W. 42nd St., New York 18, N. Y.; National Press Bldg., Washington 4, D. C.

Domestic News Bureau: Atlanta 3, Rhodes-Haverty Bldg., Chicago 11, 520 N. Michigan Ave.; Cleveland 15, Hanna Bldg., Detroit 26, Penobscot Bldg., Los Angeles 14, 621 S. Hope St.; San Francisco 4, 68 Post St.; Houston, 514 South St. *Correspondents:* Boston, Buffalo, Dallas, Dayton, Denver, Indianapolis, Jacksonville, Kansas City, Knoxville, Lansing, Louisville, Memphis, Miami, Milwaukee, New Orleans, Oklahoma City, Ogden, Philadelphia, Phoenix, Pittsburgh, Portland (Ore.), St. Louis, Salt Lake City, Seattle, Wichita and 43 other cities.

Foreign News Bureau: London, Paris, Berlin, Moscow, Tokyo, Bombay, Melbourne, Rio de Janeiro, Buenos Aires. Correspondents in Athens, Caracas, Santiago, Shanghai, Zurich, Rome, Johannesburg and over 40 other cities.

ECONOMIC STAFF
Dexter M. Keezer, Sanford S. Parker, William F. Butler, John D. Wilson

Robert F. Boger
PUBLISHER

Business Manager, J. G. Johnson

Research, W. D. Lanier

R. W. Martin, Jr., *Sales Manager:* J. C. Anthony, New York; M. J. Storz, Philadelphia; V. K. Dissette, Cleveland; L. J. Biel, Chicago; W. G. Ashmore, Atlanta; J. W. Otterson, San Francisco; C. F. McReynolds, Los Angeles. Other sales offices in Pittsburgh, Detroit, St. Louis, Boston and London.

Member of Associated Business Papers, Inc., and the Audit Bureau of Circulations

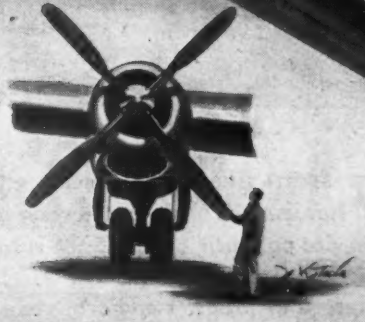
McGRAW-HILL PUBLISHING CO., Inc., Publishing Office, 99-129 N. Broadway, Albany, N. Y. Return postage guaranteed. Editorial and executive offices: 330 W. 42nd St., New York 18; 520 N. Michigan Ave., Chicago 11; 68 Post St., San Francisco 4; Aldwych House, London, W.C. 2; National Press Bldg., Washington 4, D. C.; Architects Bldg., 17th & Sansome Sts., Philadelphia 3; Hanna Bldg., Cleveland 15; 2980 Penobscot Bldg., Detroit 26; Continental Bldg., St. Louis 8; 1427 Statler Bldg., Boston 16; Rhodes-Haverty Bldg., Atlanta, 3; 621 South Hope St., Los Angeles 14; 738-9 Oliver Building, Pittsburgh 22. JAMES H. McGRAW (1860-1948), Founder; JAMES H. McGRAW, Jr., President; CURTIS W. McGRAW, Senior Vice-President and Treasurer; JOSEPH A. GERARDI, Secretary; NELSON BOND, Director of Advertising; EUGENE DUFFIELD, Editorial Assistant to President; J. E. BLACKBURN, Jr., Director of Circulation . . . Aviation Week, 330 W. 42nd St., New York 18. Published weekly, price 50¢ a copy, 50¢ in Canada. Allow at least ten days for change of address. Address all communications about subscriptions to Director of Circulation, 330 W. 42nd St., New York 18, N. Y. Subscription rates—United States and possessions, $5 a year, $ for 2 yr., $10 for 3 yr. Canada, $6 for 1 yr., $10 for 2 yr., $12 for 3 yr., payable in Canadian currency at par. Pan American countries, $10 for one yr., $16 for 2 yr., $20 for 3 yr. All other countries, $20 for 1 yr., $30 for 2 yr., $40 for 3 yr. Please indicate position and company connection on all subscription orders. Entered as second class matter July 16, 1947, at Post Office, Albany, N. Y., under Act of March 3, 1879. Volume 48, Number 15. Printed in U.S.A. Cable address "McGraw-Hill New York". Member A.B.C. Copyright 1948, McGraw-Hill Publishing Co. Aviation Week is indexed in "Reader's Guide to Periodical Literature" and in "Industrial Arts Index." Following publications are combined with AVIATION WEEK: AVIATION, AVIATION NEWS, AIR TRANSPORT, AERONAUTICAL ENGINEERING and AIRCRAFT JOURNAL. All rights to these names are reserved by McGraw-Hill Publishing Co.

CURTISS PROPELLERS BRING SERVICE-PROVED ADVANTAGES TO Boeing Stratocruisers

▸ CURTISS brings to Boeing Stratocruisers many propeller advancements—each ***service-proved*** . . . each ***soundly designed*** to meet every demand of modern airline operation.

▸ Curtiss ***pioneered*** the development and application of hollow steel blades, automatic synchronization, reverse pitch and many other now generally accepted improvements in propeller design. The Curtiss Propeller is the ***only*** reversing propeller with thousands of flight hours behind it . . . the only reversing propeller ***proved in service.***

▸ Curtiss Propellers will be used on Boeing Stratocruisers for such famous airlines as American Overseas Airlines, Scandinavian Airlines System, and United Airlines.



CURTISS ELECTRIC PROPELLERS

A PRODUCT OF

PROPELLER DIVISION CURTISS WRIGHT CALDWELL, NEW JERSEY

FIRST IN FLIGHT

22 YEARS OF CONTINUOUS SERVICE

These pictures span 22 years of Western Air Lines progress . . from its first, 400-hp., single-seater biplane to the 40-passenger, 4800-hp. Convair-Liner, soon to go into operation. The Convair-Liner is the first conventional transport designed to use exhaust gases for additional "thrust." Its cruising speed of about 300 mph. will be important in Western Air's plans for faster passenger, mail and freight schedules.

Western Air Lines uses *Texaco Aircraft Engine Oil* exclusively on all its aircraft

WESTERN AIR LINES, America's Pioneer Airline, rounds out twenty-two years of growth and service on April 17th. Texaco is happy to take this occasion to salute Western Air Lines for its long record of progress and achievement.

In 1926, its first year of operation, Western Air Lines carried a total of 209 passengers. Now, more than 500,000 passengers annually fly in its planes . . . enjoy and profit by its hearty western hospitality, courtesy and efficiency.

Western Air Lines uses *Texaco Aircraft Engine Oil* exclusively on all its aircraft. So do other leading airlines. In fact —

> ***More revenue airline miles in the U. S. are flown with Texaco Aircraft Engine Oil than with any other brand.***

And Texaco Lubrication Engineering Service is famous wherever airlines operate. You can get this service, and the complete line of Texaco Aviation Lubricants and Fuels, from the nearest of the more than 2500 Texaco Distributing Plants in the 48 States. The Texas Company, *Aviation Division,* 135 East 42nd Street, New York 17, N. Y.

TEXACO Lubricants and Fuels
FOR THE AVIATION INDUSTRY

Tune in . . . Texaco Star Theatre every Wednesday night featuring Gordon MacRae and Evelyn Knight . . . ABC Network

The Air Force High Command

The problems of an Air Force still struggling to assert its newly-won independence will descend this summer squarely on the shoulders of slim, graying Hoyt Sanford Vandenberg. A full general at 49, Vandenberg takes over from grizzled Gen. Carl A. Spaatz, only 7 years his senior but with a military career that goes back to the infantry in the days when there was no air arm. Yet Vandenberg is the first of the new generation to command our air. He went into the Air Corps directly from West Point and had a pre-war reputation as one of the hottest fighter pilots in the service. He came to military maturity in time to expand with the hot-house growth of the Army Air Forces during World War II. Vandenberg skyrocketed from a lieutenant colonel in 1940 to four star general before the end of 1947. He got an early taste of combat in North Africa flying bombardment missions as a gunner, observer and co-pilot even though he had a staff officer's job.

Inherited Problems

Vandenberg inherits the Air Force in the midst of fundamental tactical and administrative changes that will go far toward determining its eventual stature in the national defense structure. Its present place in that structure is by no means secure, despite the lip-service paid its status as an independent service. This has been made quite clear by the unstable policies of the Truman administration over the past two years and the actions of Defense Secretary Forrestal in administering the Unification Act.

It appears that Vandenberg's first big job will be to shepherd his command past these obstacles which even at this late date threaten again to relegate airpower to the subordinate role in which it stagnated before the last war. With the Republican majority in Congress already thumping strongly for airpower as the keystone in the national defense structure, a Republican victory at the polls next fall, while it would terminate the tenure of Air Secretary Symington, would certainly brighten prospects for a sound expansion of the Air Force. Although there is no good evidence on Gen. Vandenberg's political affiliations with his uncle, Senator Vandenberg, the popular assumptions most people make on that score will do neither the general nor his command any harm.

Kenney's Job

Fighting these political-military battles will be the prime task of Vandenberg, aided by Lieut. Gen. Lauris Norstad who always pops up around the planning table and has a reputation as "a brilliant staff officer." For right and left bower Vandenberg will have two capable veterans of the Spaatz generation who are expected to remain for the forseeable future—Gen. George Churchill Kenney, commander of the all-important Strategic Air Force and Gen. Joseph Taggart McNarney, commander of the Air Materiel Command. Many observers feel Kenney would make the best Air Force Commander of the trio. But those who know him best feel he would soon pall under the Pentagon routine and is perhaps happier and more effective in moulding his B-29 and B-50 bombers into the most efficient long range air striking force in the world today. Certainly there has been no evidence that the Russian, British or anybody else have anything that can remotely match the combat crews and aircraft performance of Kenney's command. Here is one field in which no one has yet dared to suggest that we have a second or third rate Air Force.

McNarney's Role

McNarney has been out of the Air Force for many years in a variety of top War Department assignments and as a result there has been a tendency within the Air Force to discount his influence in the current picture. However his long service on the Joint Chiefs of Staff as Gen. Marshall's deputy gave him an insight into the tactics and philosophy of conference table in-fighting unexcelled by any Air Force general except the old master of that terrain, "Hap" Arnold. Only since Gen. Marshall's post-war pronouncements on his lack of faith in airpower and squeamishness over employing it during war, can outsiders fully gauge the effectiveness of McNarney's and Arnold's battling in inner War Department circles during the war. Gen. McNarney's present assignment as boss of procurement, research and materiel certainly requires a man of his high caliber.

Younger Generation

McNarney, 54, and Kenney, 57, will not stay on forever. Outstanding among the next generation of Air Force leaders are Lieut. Gen. Curtis Emerson LeMay, 41, who was one of the truly sound and brilliant combat leaders of the last war. Norstad, also 41, seems destined to make his career around the conference table rather than in the field. Lieut. Gen. Nathan Twining, another leader who survived the crucible of combat command, is 50, but perhaps belongs in the younger generation category. LeMay, now commanding the Air Force in Europe, and Twining, with overall command of the Alaskan bastion, are well cast in holding down two of the hottest spots in the current strategic picture.

The present leadership of the Air Force faces as critical a set of internal and international problems as has beset the service since the stormy days of Billy Mitchell. On how well they succeed will depend the soundness of the citizens' sleep.

CP Slow-Hitting Aero Riveting Hammers deliver just the right riveting blow

CP Pneumatic Impact Wrenches speed application of nuts and screws

CP-806 Universal Electric Drills are amply powered for fast drilling up to ¼"

CP-214 Compression Riveter for fast, accurate work in close quarters

CP-450 EA Pneumatic Riveting-Dimpling Machine—Assures precision coin dimpling of magnesium and the harder aluminum alloys. Deflection plate and adjustable coining ram pressure device (exclusive with Chicago Pneumatic) assure positive control of pressures between dimpling dies, irrespective of any line pressure variations.

This improved, electrically controlled machine eliminates cracked dimples . . . controls flushness to plus or minus .001 . . . and assures accurate nesting of dimples.

for every aviation job

There's exactly the tool you need for any production job in Chicago Pneumatic Tool Company's unequaled line of Pneumatic, Universal Electric and Hicycle Electric tools . . . Riveters, Riveting-Dimpling Machines, Drills, Impact Wrenches, Screw Drivers, Nut Runners, Grinders and Sanders, Tappers, Planishing Irons, Safety Balancers. Write for further information.

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

Pneumatic Tools • Air Compressors • Electric Tools • Diesel Engines
Hydraulic Tools • Vacuum Pumps • Aviation Accessories

NEWS DIGEST

DOMESTIC

General Carl Spaatz resigned as Chief of Staff, U. S. Air Force, effective July 1 with accrued leave after May 15. General Hoyt Sanford Vandenberg, Vice Chief of Staff, was nominated by President Truman to serve as Chief of Staff for four years with the rank of General.

Congressional Aviation Policy Board introduced 22 bills in the Senate and House to implement the Board's recent report. The bills ranged from a measure authorizing aircraft procurement over periods of several years to removal of the present 15 percent tax on air travel, and include reorganization of the government's aviation agencies.

Port of New York Authority has received Federal approval for the expenditure of $1,200,000 at LaGuardia Field and $675,000 at Newark Airport under current fiscal year funds. The Authority has also completed plans for a $50,000,000 expansion of Newark Airport including the addition of 800 acres to the 1400 acres of the present site.

FINANCIAL

Bendix Aviation Corp. reported net income of $2,224,306 or $1.05 a share for the quarter year ending Dec. 31, 1947, compared with $1,385,212 or 65 cents a shart for the corresponding period last year. Consolidated gross sales for the quarter totaled $38,991,753 as against $32,332,814 last year.

Canadair Ltd.'s net sales for 1947 were $18,172,613 according to annual report of Electric Boat Co., parent organization.

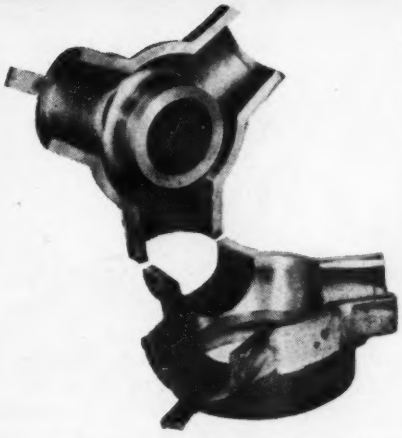
Taylorcraft Corp. reported net profit for last 7 months of 1947 of $13,041.08 on sales totaling $196,319.31.

FOREIGN

Rutas Aereas Nacionales, Sociedad Anonima (RANSA), a new Venezuelan airline has been authorized to transport air cargo by the Ministry of Communications for one year provided the Venezuelan Government is given a 15 percent discount on charges and 50 percent of cargo space is made available on demand. The airline is controlled solely by Venezuelan citizens.

Lineas Aereas de Panama, S. A. has been incorporated in the Republic of Panama to operate passenger and cargo service between Panama, Lisbon and Rome. The owners and operators of the new line are U. S. citizens. The line plans to use Lockheed Constellation transports for the Panama-Europe service.

PRESSURE WELDED BY
WYMAN-GORDON PROCESS
NICKEL-CHROMIUM-MOLYBDENUM
STEEL



Two halves of forged nickel-chromium-molybdenum steel propeller barrel, machined and ready for assembly by pressure welding into a one-piece hub.

A heat treated assembly ready for shipment. Immediately after welding, hubs are stress-relieved to prevent cooling cracks, and to allow removing weld upsets before heat treating.

Designed to absorb more horsepower and deliver more thrust for a given diameter than any 3-blade propeller now in production, the new Hamilton Standard reversing Hydromatic type provides for either reverse thrust, or feathering in less than 3 seconds.

NEW TYPE HUB

HELPS HAMILTON STANDARD PROPELLERS

- **Absorb More Power**
- **Deliver More Thrust**
- **Reverse in 3 Seconds**

Here's a hub structure that helps a new type three-blade propeller assembly attain the most favorable weight-to-size ratio ever developed.

The hub . . . first of its kind to be produced in one piece . . . is assembled by pressure welding two forged barrel halves of nickel-chromium-molybdenum steel, Type 4350.

This grade of nickel alloyed steel, long a standard material for hubs and other vital aircraft forgings, permits making strong, sound welds of good mechanical properties.

A special welding process for producing the new hub was developed by Wyman-Gordon Company, Worcester, Mass., which fabricates these parts for Hamilton Standard Propellers Division of United Aircraft Corporation, East Hartford, Conn.

Tests of some twenty production-welded barrels after heat treatment, showed properties averaging as follows:

Yield Strength (0.2% set), p.s.i.	**122,160**
Ultimate Tensile Strength, p.s.i.	**143,300**
Elongation in 2", %	**15.0**
Reduction of Area, %	**36.2**

Metal problems differ, but the wide range of nickel alloy steels allows selection of exactly the correct one for each specific application. Consult us on the use of nickel alloys in your products or equipment.

EMBLEM OF INCO SERVICE
TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the fabrication, treatment, properties and performance of engineering alloy steels, stainless steels, cast irons, brasses and bronzes, and other alloys containing Nickel. This information is yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Air Commuters

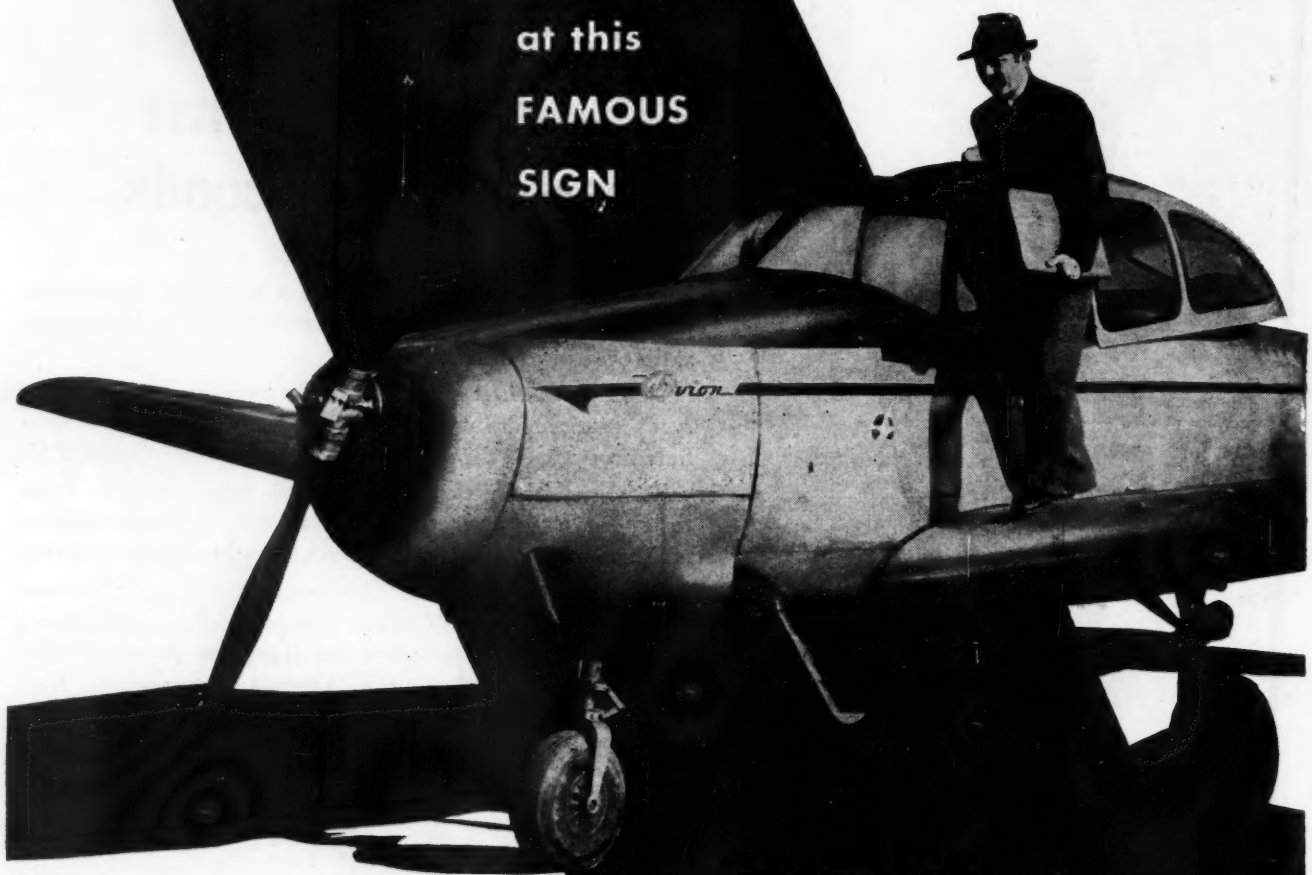
are getting better service

... more complete service

at this

FAMOUS

SIGN



Top Quality

AVIATION PETROLEUM

PRODUCTS

CITIES SERVICE

RIGHT NOW is a good time for alert airports to get behind this Cities Service aviation emblem. The exclusive products and services . . . the strong, supporting company cooperation . . . and the enthusiastic good-will of thousands of commercial and private flyers are only a few of the advantages backing up this popular sign.

Cities Service aviation products include Cities Service Aviation Gasolenes, Koolmotor and Cities Service Aero Motor Oils, exclusive Cisco Solvent engine cleaner, Cities Service Aero Greases and aviation specialty lubricants.

Keep your eye on this Cities Service aviation emblem. You'll see it on display at more and more up-to-date, alert airports every day.

CITIES SERVICE

AVIATION PRODUCTS

New York • Chicago • In the South: Arkansas Fuel Oil Co.

Vol. 48, No. 15

AVIATION WEEK

April 12, 1948

Spaatz, Symington, Vandenberg . . . he inherited a 6000 mile bomber. (Press Assn.)

Air Force B-29s Bomb Muroc On 4600 Mile Mission From Tampa

Strategic Air Command planes offer dramatic proof in range controversy; refueling techniques revealed.

By ROBERT HOTZ

Two Strategic Air Force B-29s dropped five-ton bomb loads on Muroc Dry Lake in California last week on a 4600 mile round trip from Tampa, Fla. to offer dramatic rebuttal to Navy and Congressional critics of the Air Force strategic bombing capabilities.

Although these missions did not employ mid-air refueling techniques, the Air Force also revealed that B-29s can carry out tactical missions with a 6000 mile range by combining new cruise control techniques with aerial refueling. With a 6000 mile range it would be possible for the B-29 to attack virtually any hostile target and continue on to a friendly base.

The B-29 missions were ordered by Air Secretary W. Stuart Symington to back up his earlier claims before the Senate Armed Services Committee that the B-29 now had an operating radius of 2000 nautical miles (2300 statute miles). Congressional Air Policy Board stated the "effective radius of action" of the B-29 was only 1600 miles. Symington told a press conference that this figure "never came from the Air Force." Rear Admiral H. B. Miller (USN Ret.) was executive director of the Congressional Board.

Gen. George C. Kenney's Strategic Air Command picked two crews for the mission from the same bomb group. One was a highly trained hand-picked crew and the other was an ordinary crew selected at random both flying standard service B-29s. They took off from MacDill field at Tampa each with the same gas load and 10,000 lb. of bombs. They dropped their bombs on Muroc Dry Lake in California and returned to Tampa nonstop without refueling. The hand-picked crew returned with 800 gallons of gas in their tanks while the ordinary crew still had 300 gallons.

▶ **Routine Missions**—These missions were routine for Gen. Kenney's combat crews. For more than two years they have been engaged in an extensive research and training program that has reduced cruise control to a fine art and stretched the range on standard B-29s by more than 800 miles over its wartime performance. As routine training every SAC combat crew is required to fly at least one 4000 mile simulated bombing mission every three months.

SAC's startling results with cruise control techniques are based on the use of power settings that allow for all elements of the flight rather than conventional methods based on engine performance alone and meticulous attention to detail. SAC power setting curves are varied from every 30 to 60 minutes in flight to conform with changing conditions of weight, altitude and weather. Better instrumentation including torquemeters and fuel flow meters, which will be standard on the new Boeing B-50s, are also important factors in providing precise data needed for engineers.

▶ **Reduce Gas Load**—Since SAC began its intensive cruise control program it has been possible to cut down the gas load of the B-29 and increase the bomb load over longer ranges.

Other elements include the use of pressure pattern navigation; keeping aircraft surface roughness to a minimum; proper balancing of load for all phases of the flight; operation at relatively low rpm. and high manifold pressures; reduction of cylinder head temperatures through improved cooling and baffling of cylinders; and direct fuel injection.

▶ **Aerial Refueling**—Combination of cruise control techniques with mid-air refueling offers startling new strategic possibilities for employment of Gen. Kenney's B-29s. The Air Force has been experimenting with aerial refueling techniques since March 1944. Original tests at Eglin Field using a B-24 as a tanker and a B-17 as receiver indicated the B-17s range could be increased 40 percent by refueling on the outbound flight and up to 75 percent by refueling both outbound and inbound.

The British have been experimenting over the Atlantic refueling transport Liberators and Lancastrians over the Azores, Bermuda and Gander for the past year. More recently successful experiments have been conducted with B-29s and in the Arctic and a flow rate many times faster than the British achievement of 100 gallons per minute has been developed. Biggest problems in accelerating flow rates is in develop-

ing hoses of sufficient strength, size and flexibility and getting airborne power units of sufficient strength to operate the reels required to haul the hose back into the tanker. Recently activated Boeing B-29 modification program at its Wichita plants will turn many of the large bombers being brought out of storage into tankers and equip the rest with receiving equipment.

▶ **Offers Advantages**—Aerial refueling offers opportunity to reduce critical take-off loads; reduce runway length and strength requirements; eliminates needs for advanced staging bases; and points toward the continued use of bombers smaller than the B-36 type, once considered as the only solution to the range extension problem.

Probably the first aerial refueling was done by Air Corps Lieuts. John Richter and Lowell Smith on June 25, 1923 over Coronado, California. Later the then Maj. Carl Spaatz, Capt. Ira Eaker and Lieuts. Elwood P. Quesada, Arthur I. Ennis and Harry Halverson made a circling flight of more than 11,000 miles refueling their trimotor "Question Mark" in 43 aerial contacts.

Fred Weick Goes To Texas A & M

Fred Ernest Weick, designer of the two-control Ercoupe, last week announced his resignation as vice president-engineering, Engineering & Research Corp., Riverdale, Md., to accept a post as aeronautical professor and research engineer at the Texas A & M College, Bryan, Tex.

Recognized as an outstanding authority on light airplane design in this country, Weick was a top propeller engineer and aerodynamicist at NACA's Langley Field, Va. laboratory in the early 1930's when he first developed in his spare time the revolutionary Weick W-1, a twin tail-boom two-control plane, which was later bought by CAA.

The Ercoupe was a production development of this first experimental plane. The ERCO plant built 112 of the metal-fuselage two-place Ercoupe 415Cs before World War II stopped lightplane production. Production was resumed on essentially the same plane, in 1945 at war's end, and approximately 4000 postwar Ercoupes were in owners' hands as of Nov. 1, 1947.

Weick said his new job would enable him to devote a large portion of his time to research on advanced features of light plane design, and that he will have use of the new 7 by 10 ft. wind tunnel which Texas A & M has recently built. He will also continue as a consultant with Engineering & Research, aiding the manufacturing company in the event it is decided to complete either of the experimental planes.

New Airways Agency Proposed

Administrative machinery rusty for development of RTCA electronic airways.

Warning that present divided administrative responsibilities will not produce a new electronic airways and traffic control system was sounded last week. Heetor R. Skifter, president of Airborne Instruments Laboratory, told the American Institute of Radio Engineers in New York, that a new organization, preferably within the Department of Commerce, is needed to guide the billion dollar technical development program proposed by the Radio Technical Commission for Aeronautics and endorsed by the Congressional Air Policy Board and the Air Co-ordinating Committee.

Skifter

He proposed a board composed of Air Force, Navy, Dept. of Commerce and industry representative to make all scientific policy decisions on the proposed program and a civilian scientific administrator to head the new organization and direct its work. Separate budget requests should be submitted, subject to review by the Joint Research and Development Board because of their military implications. Appropriations should be made to the Commerce Department but specifically earmarked for the purpose.

Skifter warned that although the RTCA plan was a good one and Congress was apparently in the mood to grant funds necessary for its implementation, there was great danger that the program would lag both technically and financially unless it was actively supported by more effective administrative machinery than is now available.

Surveying technical aspects of the program Skifter listed the following principal current problems:

- Settlement of technical problems by laboratory tests rather than conference compromises.
- Improvement in accuracy of the omni-range in routine operations.
- Development of a lightweight, low-cost VHF navigation and communications receiver.
- Agreement on manufacturing specifications for production models of distance measuring equipment, and development of an airborne DMW receiver suitable for lightplanes.
- Agreement on technical specification for an off-course computer for use with the omni-range.
- Expedited installation of GCA precision beam radar for bad weather landing aid at major airport terminals.
- Development of an ultra high frequency glide path airborne receiver for use with the CAA instrument landing system.
- Early decision on the question of amplitude versus phase modulation of the ILS glide path. This decision should be the result of laboratory analysis not committee action.
- Reduction of operational maintenance problems of ground radar by better engineering of equipment and development of adequate test equipment.

Congressional Review

The renewed drive in Congress for establishment of a National Science Research Foundation was marked last week by introduction of authorizing legislation in the House. Bills were presented by Rep. Charles Wolverton (R., N. J.) and Rep. Percy Priest (D., Tenn.) and are pending before the House Interstate and Foreign Commerce Committee, of which Wolverton is chairman and Priest a member.

National Science Foundation legislation has already been introduced in the Senate by Sen. Alexander Smith (R., N. J.), Sen. Elbert Thomas (D., Utah), Sen. Warren Magnuson (D., Wash.), and Sen. Guy Cordon (R., Ore.).

Other measures in the aviation field introduced last week:

- **NACA.** A measure introduced by Sen. Ray Baldwin (R., Conn.) would boost the salary of NACA members from $10,000 to $15,000 a year.
- **Parcel Post.** Chairman William Langer (R., N. D.) of the Senate Post Office and Civil Service Committee introduced the Post Office Department's proposed bill authorizing air parcel post. Rates in the Langer bill are substantially higher than those in the measure sponsored by Rep. Ed Rees (R., Kans.). The Langer bill would close the air parcel post field to the scheduled airlines already engaged in carrying the mails. The Rees bill would open the field to independent air freight operators and others.
- **CAB Review.** Delegate E. L. Bartlett of Alaska introduced two measures providing for judicial review of orders of the CAB on overseas and foreign certificates.

NAC Starts 5-Year Educational Program

National Air Council has launched its five-year educational program to promote basic recommendations of the President's Air Policy Commission and the Congressional Aviation Policy Board. (AVIATION WEEK, Mar. 15.)

Round-table radio discussions, nationwide speaker's program and distribution of books and pamphlets are planned.

▶ **Radio Talks**—Senator Owen Brewster, Representatives Carl Hinshaw, Alfred Bulwinkle, Karl Stefan and other members of the Joint Congressional Board will participate in radio talks. Also taking part in these discussions will be Harvey W. Brown, international president of the IAM, and Joseph D. Keenan, assistant director of Labor's League for Political Education.

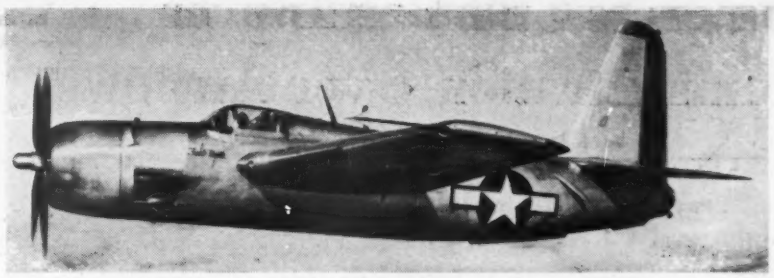
F. Trubee Davison, president of the Council, will make a tour of the Southwest in May and will address meetings in Oklahoma City, Fort Worth, and Houston. John Dwight Sullivan, executive vice president, will speak at the annual dinner of St. Paul Association of Commerce, St. Paul, Minn. on Apr. 15th and again in Milwaukee in May. William A. M. Burden, former assistant Secretary of Commerce for Air and manager of the Council, and Clyde Vandeburg, a governor of NAC, will be other speakers on this program.

▶ **Books and Leaflets**—Distribution of 10,000 copies of a graphic book on air policy recommendations will be made to state and local aviation groups, to writers, commentators, teachers, and various leaders of national organizations. The Council is also preparing leaflets on essential phases of air power. They will be placed at airports, aviation exhibits, and other vantage points. The Council has made arrangements for exhibit space at the New York International Airport's opening July 29.

A conference to be held in June at the Institute of the Aeronautical Sciences will be made up of representative educators and industrial leaders to determine how the needs of the aviation industry can be effectively brought to the attention of the country's educational institutions. The meeting will be conducted by S. Paul Johnston, director of the Institute of the Aeronautical Sciences and the executive director of the President's Air Policy Commission.

O'Connell Sworn In

Joseph J. O'Connell was sworn in this week as chairman of the Civil Aeronautics Board, following quick approval of his nomination by the Senate. O'Connell will serve for a six-year term expiring Dec. 31. He succeeds James Landis.



GRUMMAN TB3F PRODUCTION SLATED

Latest flight view of Grumman XTB3F-1 reveals side-by-side seating of pilot and radar operator, spacious fuselage for torpedoes, mines, bombs and modified wing leading edge intakes replacing jet air intake formerly used. Revised version, the AF-1, is scheduled for quantity production next fall. (H. G. Martin photo)

Gilfillan Gets $11,500,000 Order

CAA, Air Force procure GCA equipment for U.S. airfields; sets feature new design.

Largest peace-time order for radar equipment went to Gilfillan Bros. of Los Angeles last week. Air Force and CAA contracted for $11,500,000 worth of GCA equipment to aid traffic control and bad weather landing at military and civilian airports in the United States.

CAA is spending $6,000,000 for eight fixed precision beam landing and search radar sets with an $18,000,000 order for 22 additional sets scheduled for sometime after July 1. Air Force $5,500,000 order is for 10 air transportable CPN-4 GCA sets and 20 sets similar to the CAA models for permanent installation at military fields within the United States.

The new GCA sets to be built for CAA and Air Force domestic fields may be considered the first concrete step toward implementation of the Radio Technical Commission for Aeronautics recently proposed program for a modernized electronic airways and traffic control system. The RTCA report specifically recommended a speedup of GCA installations until they approximated the number of ILS radio landing systems already installed.

New GCA sets are the first specifically designed for civilian use at fixed installations in contrast to the old military model houses in trailers to achieve maximum mobility. The new sets will incorporate a moving target indicator that eliminates all ground clutter from the scope picture; the azel three-dimensional scope; and increased search coverage up to 10,000 ft. altitude and out to range of 35 miles. These sets required only a single operator in contrast to the five man crews of earlier models.

CAA plans to install its first new GCA at Los Angeles within a year. Other sets are earmarked for Cleveland, Atlanta, St. Louis, Boston and then as replacements for present GCA equipped operated by CAA at Washington, New York and Chicago. GCA at these three airports is credited by the CAA with 27 "saves" of pilots in difficulty during less than a year's steady operation.

In addition to the current CAA operations, GCA is now operational at 80 Air Force bases; 30 Navy fields; 17 RAF and RCAF installations and 12 civil airports abroad.

Air Force Withdraws C-46s From Surplus

Air Force last week withdrew 362 Curtiss C-46 Commando transports from surplus sale by the War Assets Administration. WAA had released a final C-46 offering at a flat price of $5000 each. This group is in addition to a similar lot withdrawn from long-time storage at Walnut Ridge, Ark., by the Air Force a month ago. This latter group was not surplus but undergoing outdoor storage by the Air Force.

At the time of the original withdrawal, the Air Force offered the huge craft for lease to operators at a flat fee of $300 per month per plane. Observers indicate that not more than 50 Commando transports could be absorbed by the non-certificated carriers, leading to speculation that the C-46s are being withdrawn for direct Air Force use as cargo carriers. The C-46F, a substantial number of which are available, are equipped with double rear doors designed to accommodate two lines of paratroop exits simultaneously.

De Havilland Expands

De Havilland Aircraft Co., Ltd. will supplement its present production facilities by taking over a government factory at Broughton, Chester, England.

Congress Still Battling Truman Administration Over Airpower

Forrestal rebuttal on "balanced" defense program coolly received on Capitol Hill; Republicans want 70 air groups.

The boom for a 70 Group Air Force gathered momentum in Washington last week.

Highlights of developments:

Presidential request for a $3,375,000,000 national defense supplemental for the 1949 fiscal year including only an additional $775,000,000 for aircraft procurement touched off renewed demands in Congress for the 70-Group program advocated by USAF. House Speaker Joseph Martin (R., Mass.) reiterated his support for the 70 Group program.

Secretary James Forrestal submitted a 10-page defense for his "balanced" rearmament program contemplated in the $3,740,000,000 supplemental to Congress where it was coolly received. In a statement to Chairman Chan Gurney (R., S. D.) of the Senate Armed Services Committee countering Air Secretary Stuart Symington's support for a 70 Group air program, Forrestal affirmed his position that the program, along with "balanced" increases for sea and ground forces, would mean an annual national defense budget of over $28,200,000,000 — $18,000,000,000 over the current year. "I did not intend to suggest the creation at this time of such a costly military establishment", Forrestal declared. Subsequently he commented that "I do not wish to foreclose the possibility that I may come before you to request the full 70 Air Group program, with its essential concomitants, or some other or different program, based on continuing studies by the joint chiefs of staff and reviewed by me."

A House Armed Services Subcommittee, headed by Rep. Charles Clason (R., Mass.) approved a resolution calling on the administration to submit a request for $2,388,000,000 in additional funds to implement the 70 Air Group program, and announced its intention to push legislation authorizing it. The group took its action following a prolonged executive session with Symington. The additional funds would boost the coming-year USAF budget to $5,442,000,000. The administration has already requested a total of $3,054,000,000.

Bills underwriting the 70 Group program were introduced by Rep. Arthur Winstead (D., Miss.) and Rep. Philip Philbin (D., Mass.). Rep. Chester Merrow (R., N. H.) has already proposed legislation calling for appropriations for the program.

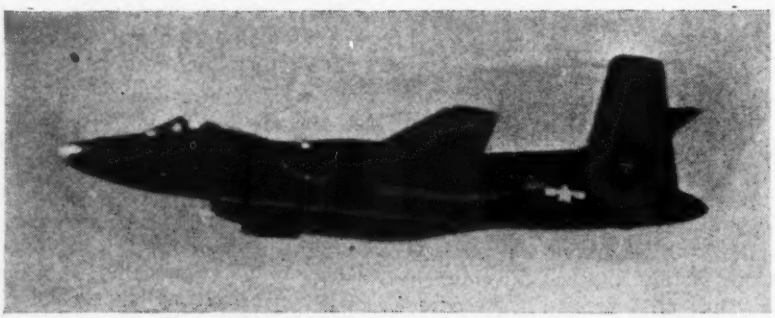
Key senators denounced Forrestal's contention that the 70 Group program would necessitate "balancing" increases in sea and ground forces and mean an $18,000,000,000 budget increase. "Balanced military strength," Sen. Burnet Maybank (D., S. C.), a member of the Armed Services Committee, commented, "does not mean that the Army and Navy have to be given a dollar apiece every time another dollar is added to the Air Force budget." Sen. William Knowland (R., Calif.), a member of the Appropriations Committee, issued a concurring statement. Sen. Henry Cabot Lodge, (R., Mass.) pointed out that last year he proposed funds to provide for a 70 Group program and declared, "there were sufficient reasons at that time to justify the program. There are even better reasons today."

In his lengthy defense and explanation of "balanced" services, Forrestal highlighted the support requirements for a 70 Air Group program, primarily in ground crews and sea supply.

"In sustained modern combat, none of the armed forces will operate independently," he claimed, but conceded: "the Air Force will frequently play the predominant role, with the Army and Navy conducting operations to facilitate the effective use of the air weapon. Then there may be situations in which the Navy or the other two services run 'interference'."

Latest Air Force estimates for implementation of the 70 Group program would involve procurement appropriations of $2,037,000,000 for the 1949 fiscal year; $2,738,000,000 for 1950 fiscal; $3,303,000,000 for 1951 fiscal; $3,200,000,000 thereafter. The present USAF budget, including funds in the supplemental ($465,000,000 is allocated for USAF procurement), provides a total of $1,392,000,000 for procurement. USAF has boosted its procurement estimates for the 70 Group program since the President's Air Policy Commission's report was issued. At that time, the service estimated a $900,000,000 allocation for the 1948 calendar year and a $1,560,000,000 allocation for the 1949 calendar year.

The Navy's proposed 14,500-plane program, Forrestal reported, would entail annual procurement appropriations of $1,221,000,000. This compares with the recommendation of the President's Air Policy Commission for Naval Aviation procurement appropriations (excluding research and development) of $530,000,000 for the 1948 calendar year and $840,000,000 for the 1949 calendar year. The present budget, including funds in the supplemental ($310,000,000 of the $775,000,000 provided for aircraft procurement is earmarked for Naval Aviation), provides $863,000,000 for naval aircraft procurement, including $75,000,000 for research and development.

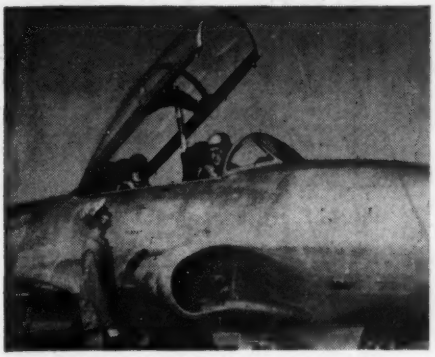


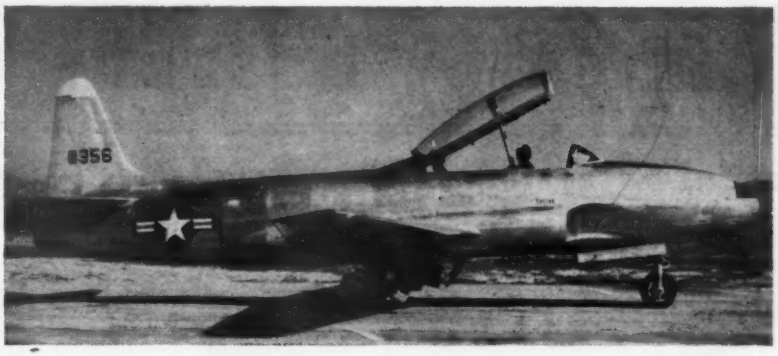
LARGEST JET FIGHTER FLIES

First flight view with gear retracted reveals slim lines of Curtiss XP-87 four-jet all-weather fighter on first test at Muroc Air Force Base, Calif. Plane remained aloft nearly one hour, unusual for a first flight and testimony to pilot satisfaction with the design. Production contract for the huge fighter is now being negotiated.

New Transport Aid

Senate Interstate and Foreign Commerce Committee last week approved two measures to implement U. S. overseas air transport with navigational aids. One measure authorizes the Coast Guard to operate Loran stations, and the other, to operate ocean stations. Although the service is currently maintaining networks of Loran stations covering the north Atlantic and north Pacific, and two ocean stations in the north Atlantic and one in the Pacific, it is without legal authorization for the activity. As a result it has bucked opposition in obtaining appropriations.





P-80 TANDEM TRAINER

Longer by 38 inches than the standard Air Force P-80 is this new two-seat trainer version, TF-80C, now being built by Lockheed. All basic controls are dual, and plane can be used for gunnery and high speed navigation instruction as well as flight training. Plane is powered by Allison 400 engine, having higher thrust than standard P-80 turbojet.

Airport Operators Speak Out

New organization of largest airline terminals holds first meeting. Aim: uniform accounts and practices.

Major airport operators heard the "tenants' point of view" when the newly-formed Airport Operators Council met Apr. 1-3 in Boston for their first annual meeting.

Discussion subjects ranged from scheduled and cargo carriers, petroleum companies and surface transportation to vending machines and governmental agencies. The 20 members of the organization and more than 100 smaller airport operators and tenants crowded the public sessions.

▶ **Only the Large**—The council comprises only airports which handle at least one percent of all scheduled carrier movements in the U. S. Representatives went on record as opposing the proposed regulation listing minimum fire fighting and rescue equipment for an airport, which it termed "unwarranted and constituting a burden on airport operators which cannot be met." It recommended that CAA be permitted to judge minimum equipment of this kind on an individual airport basis.

Sharp differences of opinion on the question of special charges and fees on gasoline and other air terminal "tax targets" developed at the three-day session.

▶ **Standard Formula**—After Governor Robert T. Bradford of Massachusetts had called for "a standard formula as the basis for similar charges for similar services," Robert Ramspeck, executive vice president of the Air Transport Association, took sharp issue, and declared:

"Special fees on gallonage, storage or dispensing facilities may well be followed by similar levies on spark plugs, tires or other aircraft parts or accessories. Concession fees and gallonage charges may be an easy way to raise money, but they are obviously unfair ways because revenues from this source bear no reasonable relationship to the use of an airport."

Governor Bradford, reporting he had found that there is no such thing as standard practice "in the whole vast business of operating the airports for which the taxpayer has to put up the money," warned:

"If we are to accept the comfortable assumption that government in business is always to be played for a sucker, perhaps such a situation could continue indefinitely."

▶ **National Program**—Sidestepping this issue, the council adopted a number of resolutions, one of them requesting the Congress to appropriate each year the entire $100,000,000 called for in the National Airport Act.

Other resolutions proposed that the Post Office Department, Customs and other Federal agencies be required to lease or buy needed airport property; that airports be notified of any proposed changes in CAB Economic Regulations and foreign air carrier permits in which they might be concerned; that non-flight revenues be fully developed; that "reasonable rules" be adopted for airport ground transportation, and that the council offer assistance in matters before the Air Coordinating Committee.

During discussion of airport fueling, Warren L. Baker, manager of the Socony-Vacuum Oil Co. at New York, warned that such big planes as the Boeing Stratocruiser, "cannot be fueled within a reasonable time with the facilities now available," and said systems would have to be improved to meet changing requirements.

Bennett H. Griffin, Washington National Airport administrator, outlined the advantages of underground systems, reducing "the number of fuel trucks that are used on the field," and noting that at some airports "trucks are so numerous and operated at such speeds that they constitute a definite hazard to passengers, ramp personnel and planes."

W. F. Rogers, vice president of Slick Airways, forecast that "the continuous and inevitable growth of the airfreight industry will mean money in the bank to every airport operator who encourages and cooperates with the airfreight carriers." He said airfreight "expects to pay its own way" at airports, and that "now is the time for airport operators, through airfreight, to plan for volume business."

▶ **Secretary Wanted**—Now planning a full scale information and education program among member airports, the AOC is shopping for a competent young man to be executive secretary for the group.

J. Victor Dallin of Philadelphia was re-elected president. Other officers named: B. M. Doolin of San Francisco and James C. Buckley of the Port of New York Authority, first and second vice presidents; Leander Shelley of New York, general counsel, and Claude King of Cleveland and H. Brookhoff of St. Louis, directors.

Sidelights of the meeting:

- No landing fees were charged at Boston airport to members who flew to the meeting.
- Arrangements were made for transportation to the convention of the Association of Airport Executives which followed the three day AOC sessions. Many members of AOC are also members of the AAE, which differs in scope, since AOC deals only with large airline airports having very specialized problems in policy development, while AAE is concerned more with the day to day operations at all airports.

INDUSTRY OBSERVER

► **Lockheed Test Pilot Stanley Beltz gave some Air Force and Navy brass the fright of their lives recently when he asked the Anacostia (Washington, D.C.) tower to clear the Navy field for his approach in a Lockheed P2V Neptune. Beltz flew the big, twin engine patrol bomber in on one engine and then, as the brass scuttled for cover he slow-rolled it at less than 500 ft. altitude. Beltz concluded with some steep turns into the dead engine.**

► Curtiss-Wright is nearing completion of its second XP-87 four-jet all weather fighter at its Columbus plant. First plane is undergoing extensive flight tests at Muroc.

► **Texas Engineering and Manufacturing Co. at Dallas is modifying nine Martin 2-0-2 transports for Northwest Airlines. Modifications are all on passenger features and include a carry-on baggage compartment, enlarged cooking galley and a coat room forward.**

► French report: Prototype of Aerocentre NC2001 helicopter crashed recently after 70 hours of flying; Aerocentre is developing a 400 mph. 40-passenger commercial jet transport to be designated the NC290 and powered by four Hispano built Nene turbojets grouped in two nacelles; Aeronord is building 25 large cargo gliders and a motorized version of the gliders for service as a 15-passenger transport.

► **Production models of the British Airspeed Ambassador will be powered by Bristol Centaurus 663 engines and will have their split flaps replaced with slotted flaps. Gross weight will be boosted from the present 45,000 lb. to 52,500 lb. British European Airways plans to operate the Ambassadors at 49,000 lb. gross.**

► Trans-Canada Airlines is nearing completion of deliveries on a total order for 20 DC-4M pressurized transport planes, which will be used on domestic routes. Recent trans-Atlantic DC-4M flights have been service test flights only.

► **Northwest Airlines expects to pay approximately $2,000,000 each for its Boeing 377 Stratocruisers. Contract price of $1,500,000 contains escalation clauses which will raise price, making the Stratocruiser the most expensive aircraft ever delivered to a commercial airline.**

► Eastern Airlines is now test flying a Lockheed Constellation equipped with the NACA undercowl airscoop designed to prevent entrance of ice, snow or water into the carburetor using the inertia separator principle. If tests prove successful, all EAL Connies will be equipped with this cowl.

► **American Airlines is complaining about one of the Convair-Liner's salient features: its orange peel engine cowl access door. Trouble arises from prop blast of taxiing aircraft and high ground winds bending the open door out of line. Torsion-loaded rubber bushings cause door to spring up automatically forcing the door out of line for closing.**

► Royal Canadian Air Force has started a new training scheme using the Canadian-built DC-4M North Star aircraft. Shake-down flights with the aircraft carrying five to six tons of payload will be made between Goose Bay, Labrador, and Montreal, as a starter, and later across the Dominion to Whitehorse, Yukon.

► **Sperry has revived interest in its "zero reader" and has installed a "breadboard" model in Air Transport Association's research DC-3 Beta for flight testing. The zero reader adds rate control to ILS or Sperry Microwave landing system cross-pointer indicators and offers a superior method of manually flying either beam landing system.**

► National Airlines is now using radiant heat to shrink master rod pins, which has cut assembly time in half. One of the first airlines to utilize the system, the method makes use of a small box in which a battery of powerful lights play on the part to be heated. Heating is even, can be carefully controlled and is quicker than older oven method.

CAB Extends Deadline Of New Fire Regulations

Deadline for compliance by scheduled and nonscheduled air carriers with CAB's revised fire prevention regulations has been extended to Nov. 1.

The Board said that the great majority of passenger planes in scheduled service and some aircraft in nonscheduled operation will be modified as required by May 1, 1948. But it also found that some planes will not be fully modified by that date because sufficient parts were not available.

Adopted in September, 1946, the fire prevention amendments to Parts 04A, 04B, 41, 42 and 61 of the Civil Air Regulations originally were slated to become effective last Jan. 1. CAB contemplates no further extension beyond the new Nov. 1 deadline.

AVIATION CALENDAR

Apr. 13—AIA Personal Aircraft Council, Dallas.
Apr. 13-14-15—California Aviation Conference sponsored by Los Angeles, San Francisco and San Diego Chambers of Commerce, Los Angeles.
April 13-15—Society of Automotive Engineers National Aeronautic Meeting, Hotel Astor, New York.
Apr. 15-17—AIA National Aircraft Standards Committee, Hotel Statler, Washington.
Apr. 16—Doolittle Tokyo flyers reunion, Hotel Dychman, Minneapolis.
Apr. 17-18—Southern States Air Carnival, Montgomery, Ala.
Apr. 17-24—Northwest aviation exposition, Minneapolis auditorium, Minneapolis.
Apr. 20—ICAO rules of the air and air traffic control division, Montreal.
Apr. 20-21—Second Annual Third-Regional Aviation Conference, Minneapolis Auditorium.
Apr. 22-23—AIA personal aircraft council meeting, Dallas.
Apr. 22-24—Fourth annual forum, American Helicopter Society, Philadelphia.
April 22-24—Aviation and Airport Management Conference, Minneapolis.
April 24—Dedication of "Wright Way" (Skyway 1), Municipal Airport, Dayton.
Apr. 27—ICAO facilitation division, Europe.
Apr. 27-May 26—American University's Second Annual Foreign Transportation Institute, Washington, D. C.
Apr. 28-30—American Institute of Electrical Engineers, northeastern district meeting, New Haven, Conn.
May 4—ICAO North-Atlantic regional meeting, Paris.
May 4—ICAO European-Mediterranean Regional Meeting, Paris.
May 5-6—Air Transportation Education Conference, Purdue University, Lafayette, Ind.
May 12-15—Aviation Writers Association, 10th Annual Convention, New York City.
May 16—Annual Cotton Carnival Air Show, Memphis, Tenn.
May 17—ICAO facilitation division, Geneva.
May 17—ICAO North Atlantic Regional Meeting, Paris.
May 18-20—AIA board of governors meeting, Williamsburgh, Va.
May 19—Air Commerce Day at Miami, part of World Trade Week observance.
May 20—ICAO European-Mediterranean regional meeting, Paris.
May 23—Seventh annual national meeting, Society of Aeronautical Weight Engineers, Columbus, Ohio.

ENGINEERING & PRODUCTION

Commercial Business: All Loss?

Lockheed report lays 1947 deficit to transport market and company stakes profit hopes on military contracts.

The price a manufacturer pays to produce a commercial transport plane is highlighted again in the Lockheed annual report.

Douglas was first to report high 1947 losses due to the financial instability of the commercial market. Then Martin showed an even greater deficit. The Lockheed report in some respects is more illuminating than the others.

▶**Back to Military**—Lockheed's 1947 sales of $134,364,006 were 47 percent commercial. Net loss was $2,471,695—due mainly, the company states, to "the commercial models as opposed to the military models." The commercial business was "accompanied by an incommensurate amount of problems and complications."

One of the major complications was the by now familiar one of lack of both domestic airline capital and dollar balances abroad. But with heavy write-downs of inventories on the Constellation, Lockheed can go ahead with what amounts to a clean slate on a fully-developed, proven airplane. Profits from commercial business appear to be in the offing.

Nevertheless, chances for profits this year are stacked on military business. The present backlog is $124,820,000, about 84 percent of which is military—P-80, P2V, Constitution and research and development.

▶**Full Circle**—Thus Lockheed, like other manufacturers, has gone the full circle. At the end of the war it was one of the first to get new transports into the hands of the airlines. At that point its future in the commercial market looked bright, with military sales subordinate. It planned a feederliner, the Saturn, and stirred up an incipient merger with Consolidated Vultee that would have given it transport planes in all categories.

The merger never went through. The Saturn was dropped definitely at the end of 1947 and the annual report gives the cost: $1,856,853. The market for the Connie dwindled and now Lockheed is deriving its chief income once again from government business.

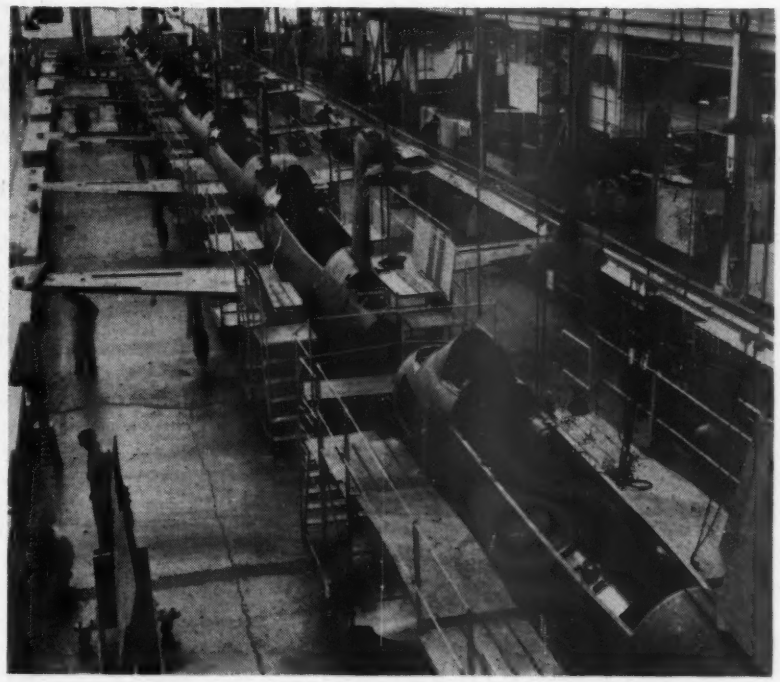
▶**Military Connies** — But lending strength to Lockheed's transport activities is the new Air Force order for cargo Constellations, reportedly ten. While these probably will be greatly modified (some time ago the company submitted a proposal for a Connie with a detachable "pod" larger than its Speedpak), they should still be similar enough to the basic Connie to keep a transport line going. The company says that this order will extend Constellation production into the first quarter of 1949.

Commercial Connies will be released for production only when firm orders have been received. In this way, the company will avoid the dangerous situation it once confronted—having huge sums tied up in inventories on speculation. At the end of 1946 it had more than $100,000,000 tied up in inventories; last year this was cut down to approximately $52,000,000 and a further cut this year has brought it to about $49,000,000.

Lockheed Salaries

In its notice to stockholders, Lockheed Aircraft Corp. listed the 1947 salaries of its executives:

Robert E. Gross, president, $66,670; C. A. Barker, Jr., vice president-treasurer, $49,131; Cyril Chappellet, vice president, $35,603; Hall L. Hibbard, vice president-engineering, $35,433; Carl B. Squier, vice president-sales, $35,433, Herbert E. Ryker, vice president-manufacturing, $35,433; Courtland S. Gross, vice president-general manager $48,482.



NORTH AMERICAN FURY PRODUCTION

First photo of North American FJ-1 Fury production line discloses "bath-tub" power plant installation. This differs from other "split fuselage" designs as the engine is swung into position from overhead. Engine is covered by quickly removable panels to permit ease of access for field servicing. North American "high volume" preparedness planning tooling methods are illustrated in individual assembly stands which move along track in floor. Although only 30 FJ-1 fighters are on order, production could be expanded quickly with this mechanized assembly method. (Navy photo)

Foreign Airport Aid

Legislation designed to promote development of overseas airport facilities for U. S. carriers is set for approval by the House Interstate and Foreign Commerce Committee and early action by the Senate Interstate Committee. The measure authorizes Civil Aeronautics Administration to take over and operate foreign bases held by the armed services and to train foreign nationals in the operation of the facilities. It contemplates relieving U. S. overseas airlines of the burden of support for operation of facilities at numerous points.

Lear Names Thrun To New Sales Post

Lear, Inc., Grand Rapids, Mich., has named Arthur G. Thrun sales manager of its aviation radio division with headquarters in Grand Rapids. He succeeds Henry J. Hamm who was transferred to the California division.

Thrun has had more than 18 yr. of domestic and foreign experience in the radio and aviation fields both as pilot and radio engineer. He served in the Naval Air Transport Service for almost five years as officer and pilot. He was formerly with the aviation radio sales section of the Engineering Products Div., Radio Corp. of America.

► **New Director**—Lear also announces that Frederick D. Gearhart, Jr., has been elected a director. Gearhart is president of Gearhart & Co., Inc., N. Y. financial underwriters. He is also director of Higgins Industries, Consolidated Industries, and Wilcox-Gay Corp.

In other personnel developments:

• **Esso Standard Oil Co., N. Y.,** appointed Dr. H. G. Burks, Jr., general manager of manufacturing operations. At the same time, H. W. Fisher was named to succeed Dr. Burks as general manager of East Coast refineries. Both men are directors of the company.

• **Boeing Airplane Co.** has promoted W. W. Rutledge to first assistant to the vice president of manufacturing. Rutledge was formerly manager of experimental production. Roger Holman, assistant to the vice-president of manufacturing, will assume direction of plant engineering, maintenance and transportation.

• **Consolidated Vultee Aircraft Corp.** named Georges de Sonchen director of European sales. For the past six months, de Sonchen has been general manager and executive vice president of Aero-Transportes, S. A.

• **Northrop Aircraft, Inc.** promoted J. V. Naish to factory manager. Conrad Kunze, formerly assistant director of material, will succeed Naish as procurement head. C. B. Spencer, who has been named assistant factory manager and production superintendent, was formerly production superintendent.

• **Houdry Process Corp.** elected David N. Hauseman, Brig. General, U. S. Army, Ret., president. He succeeds Eugene J. Houdry, founder of the company.

• **Merrimac Div.,** Monsanto Chemical Co., Everett, Mass., appointed James A. Wilson production manager. Formerly plant manager of the company, Wilson is being succeeded in that position by Russell L. Miller. Dr. Frederic Matthews has been named director of research for the division.

• **Sperry Corp.** elected I. J. Harvey, Jr., a director. He is president of the Flintkote Co.

• **Allis-Chalmers Mfg. Co.** named James M. Barker to the board of directors. He replaces Alfred J. Kieckhefer who has resigned.

• **Bell Aircraft Corp.** elected David M. Milton and Webster B. Todd members of the board of directors. Membership of the board was reduced from ten to eight and resignations were accepted from Charles A. Criqui, John W. deForest, Mark J. Millard, Carl M. Loeb, and Ansley W. Sawyer.

• **Westinghouse Electric Corp.** appointed L. H. Gillette of the heating section sales, transportation and generator division with headquarters in Meadville, Pa. Dr. John A. Hutcheson has been named director of research. He succeeds Dr. L. Warrington Chubb, retired.

• **Vickers Inc.** assigned James W. Kelley and Fred V. Gieryn to its regional sales engineering staff. Kelley has been in production, engineering and sales work at company since 1946. Gieryn joined the company in 1945 following several years of engineering work with General Electric.

• **G. M. Giannini & Co.** announces that Alfred J. Klose has rejoined its company. Klose developed first American pulse jet engine accepted for testing by Wright Field in 1942. Since that time he has been active in the development of supersonic reaction power plants and as a consulting engineer on missiles and high-speed aircraft.

• **B. G. Corp.** named Albert P. Elebash assistant sales and service manager. Elebash was formerly division engineer for the Atlantic division of Pan American World Airways and during the war he aided in the establishment of the first Air Transport Command service between Miami and Natal, Brazil.

Survey Shows Slump In Aircraft Sales

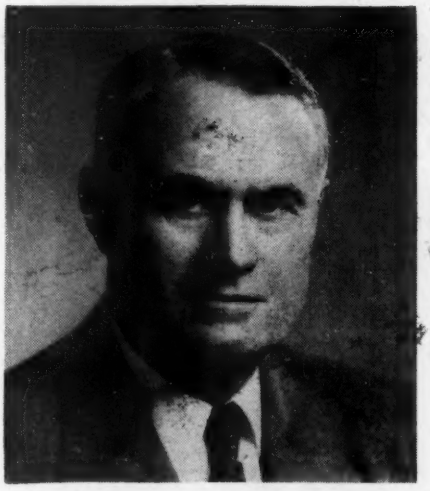
Extent of the precipitous decline in aircraft sales during the postwar period is disclosed in a recent survey made by the Securities and Exchange Commission among 19 plane builders.

Net sales by the 19 companies surveyed dropped from $5,752,814,000 in 1945 to $746,786,000 in 1946. Net profit after income taxes aggregated $15,433,000 in 1946, representing a return on net worth at the beginning of the year of 2.9 percent. This compares with a $119,893,000 profit in 1945, equal to a return on net worth at the beginning of that year of 28.9 percent.

As a percent of net sales, net profit after taxes amounted to 2.1 percent in 1946 and 2.1 percent in 1945. Income tax refunds received by these companies amounted to $67,016,000 in 1946. In 1945 the companies charged $225,493,000 for income tax provisions. Dividends paid amounted to $32,299,000 in 1946 and $33,749,000 in 1945.

Earned surplus at the beginning of 1945 for the 19 firms amounted to $258,100,000; at the end of 1945 earned surplus amounted to $374,359,000; and at the end of 1946 was $423,464,000. Net worth at the beginning of 1945 amounted to $415,534,000 and rose to $539,296,000 at the beginning of 1946.

The companies were Beech Aircraft Corp., Bell Aircraft Corp., Bellanca Aircraft Corp., Boeing Airplane Co., Cessna Aircraft Co., Consolidated Aircraft Corp., Curtiss-Wright Corp., Douglas Aircraft Co., Inc., Fairchild Engine and Airplane Corp., Grumman Aircraft Engineering Corp., Lockheed Aircraft Corp., Glenn L. Martin Co., North American Aviation, Inc., Northrop Aircraft, Inc., Piper Aircraft Corp., Republic Aviation Corp., Ryan Aeronautical Co., United Aircraft Corp., and Waco Aircraft Co.



FAIRCHILD PRESIDENT

L. B. Richardson, new president of Fairchild Engine and Airplane Corp., was former vice president and executive assistant to the president of Curtiss-Wright Corp. He succeeds J. Carlton Ward, who becomes board chairman of Fairchild. Richardson is a member of the Council of the Institute of Aeronautical Sciences and of the Visiting Committee of the Department of Aeronautical Sciences at M.I.T. Before joining C-W, he was a rear admiral, serving at one time as deputy chief of the Bureau of Aeronautics.

Injury Rate Falls in '47 Among Aircraft Workers

Work injury rate in both aircraft and aircraft parts industries during 1947 fell far below 1946 according to preliminary statistics issued by the Bureau of Labor Statistics.

During 1947, the average number of disabling work injuries for every million employee-hours worked dropped from 5.2 to 4.6 in aircraft. In aircraft parts, the improvement was still better, the injury rate dropping from 13.7 to 8.4.

Injury frequency in manufacturing industries has shown a seasonal pattern over the past five years, BLS finds. Injuries are lowest during December and reach their peak during the hot summer months of July and August. The 1947 peak came in August, when the rate was 17.1 disabling injuries for every million employee-hours recorded by the industry.

Boeing To Maintain Union Shop Agreements

Eligible employes of the Boeing Airplane Co., Seattle, Wash., have voted 12,136 to 663 in favor of maintaining union-shop agreements with the company, the National Labor Relations Board announced after conducting an election.

Union-shop conditions have existed at the company for a number of years, but the Taft-Hartley Act requires elections before unions can seek them in new contracts. The company and the Aeronautical Mechanics Union now are negotiating a new contract.

Dangers Taken Out of Ditching By Special Flap and Foil Devices

NACA's hydroflaps and hydrofoils reduce noseover tendencies and protect fuselage bottoms in water setdowns of landplanes, and there is no cost in drag.

By ROBERT McLARREN

Although the reliability of the modern reciprocating aircraft engine permits transoceanic landplane travel with a high degree of safety, a descent at sea is always a possibility. Inordinately strong headwinds, undetected fuel leakage, fire, communication and navigational equipment failures and multi-engine failure may make ditching necessary.

Major risk in such setdowns is structural failure of the fuselage caused by violent "digging in" of the craft's nose. But tests and practical experience indicate that the dangers can be substantially reduced by the use of hydroflaps and hydrofoils.

Risk of ditching of aircraft during wartime is considerably greater due to enemy action. For this reason the National Advisory Committee for Aeronautics conducted an extensive wartime research program on the ditching characteristics of 17 different military aircraft.[1]

In the course of these studies the only two full-scale experimental ditchings made during the hostilities were carried out to correlate results with those from model tests.[2, 3] The trials with dynamically similar models were made by drops into the Langley Tank No. 2 and projection into water from an outdoor catapult. These tests were made both with the model intact and with major portions of the model removed to simulate structural failures of bomb bay doors, belly turrets, nose gear doors, etc.[4, 5, 6, 7, 8]

This testing produced the five major items of procedure for ditching:

▶ **Attitude**—Plane should be brought down in a three-point landing attitude and its speed reduced to a minimum before contact.

▶ **Flaps**—Flaps should be lowered from one-half to full-down, depending on individual plane, in order to slow craft to minimum speed.

▶ **Passengers and Crew**—Occupants of plane should brace themselves as well as possible to withstand decelerations of from 2 to 8 Gs, depending on plane design and the nature of the impact.

▶ **Level Wings**—Plane wings should be held as near level as possible to prevent a violent turn resulting from contact of one wingtip with water.

▶ **Wind Conditions**—When there is only a moderate wind, approach should be made parallel with crest of waves. However, if surface wind is high, approach should be made directly into wind, usually normal to crests.

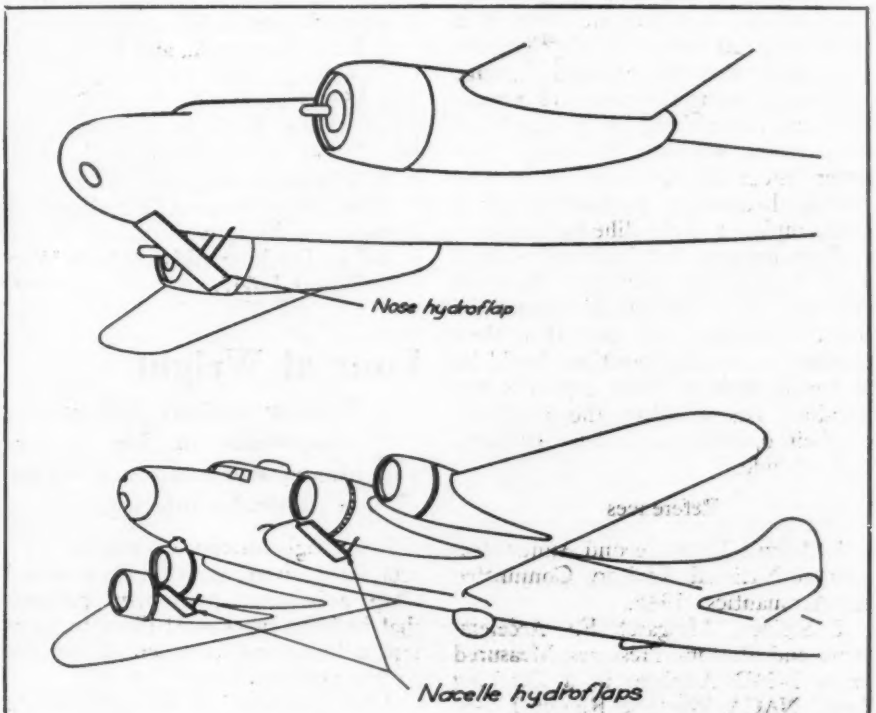
On the basis of the NACA research, it quickly became apparent that a ditching aid, to be effective, should dissipate the vertical and angular momentum, prevent the nose of the airplane from digging into the water and deflect the water from the bottom of the fuselage so as to reduce loads during ditching.[9] In addition, the aid should offer little aerodynamic drag, be simple and require only a slight modification to the plane. Meeting these requirements is the NACA hydroflap and the hydrofoil.

The hydroflap is a long, inclined plate. It is installed beneath the plane's nose—or, using two of them, under the forward portion of the engine nacelles. The device serves to absorb the water impact and to allow the craft to plane along, with nose, engine nacelles and forward portion of the fuselage out of the water, until nearly all momentum has been dissipated.

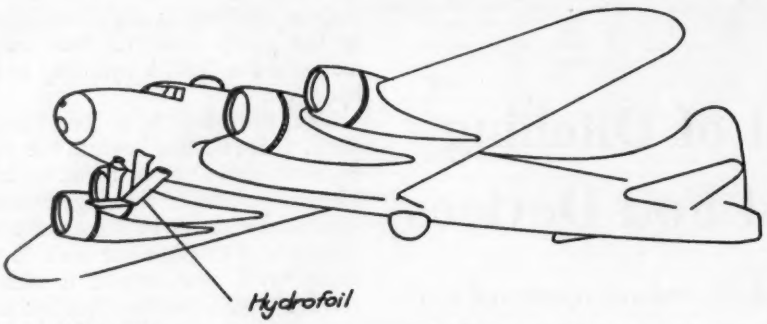
It is noted that the hydroflap should be comparatively narrow to reduce the initial loading. Moreover, it should project down a considerable distance, in order that both flap and rear of fuselage will contact the water at about the same time. Also, the device should hold the nose out of the water while the tail sinks into its wake.

The NACA hydroflap can be made retractable into fuselage or engine nacelle, thereby reducing its aerodynamic drag to zero in the air. As used on the Martin XP4M-1 Mercator patrol plane, the hydroflap is actually the front entrance door strengthened to sustain 10,000 lb. when lowered 30 deg. It adds only 11 lb. to the 40-ton craft. Use of this flap is also being studied for the Lockheed P2V-2 Neptune patrol plane.

The other device—the hydrofoil—accomplishes the same purpose as the hydroflap, but in a slightly different manner. It consists of a V-type plate,



Single installation of hydroflap is seen (top) on nose of Army B-25, while drawing above depicts pair-positioning of flaps on B-17F's inboard nacelles.



Hydrofoil is V-type planing surface suspended by struts below plane's nose.

with a span of several feet, suspended below the nose of the plane on struts, with its chord substantially parallel to the fuselage reference line. As the hydrofoil strikes the water it acts as a planing surface.

However, the foil's short chord and low positive angle of incidence prevent its sustaining the weight of the plane, and it becomes immersed. And when, in the course of a setdown, it sinks four or five chord lengths (at which point the plane's fuselage nears the surface) the greatly increased density of the water, in combination with the forward speed, generates considerable lift from the hydrofoil, tending to raise it to the surface.

Only objection to this device is the fact that, should it assume a negative angle at any time during the ditching, a downward force is created which is hazardous.

Extensive model tests of these devices indicate that they are effective in decreasing an aircraft's deceleration, thus protecting the forward fuselage bottom, reducing the nose diving tendency and diminishing the yawing tendency during wing-low ditchings. This latter effect is produced by engine nacelle hydroflaps, particularly when they employ a slight dihedral angle.

Tests indicate that hydrofoils should have trapezoidal planforms, that all foils used on a craft should contact the water simultaneously and that their maximum extended position should be at a wide angle with the airplane's longitudinal axis to reduce the possibility of their operating at a level or negative attitude.

References

1. Anon.: Thirty-Second Annual Report of National Advisory Committee for Aeronautics, 1946.

2. Steiner, Margaret F.: Accelerations and Bottom Pressures Measured on a B-24D Airplane in a Ditching Test. NACA Wartime Report L-648.

3. Jarvis, George A., and Fisher, Lloyd J.: Correlation Tests of the Ditching Behavior of an Army B-24D Airplane and a One-Sixteenth Size Model. NACA Wartime Report L-617.

4. Jarvis, George A., and Steiner, Margaret F.: Ditching Tests With a One-Tenth Size Model of the Army A-20A Airplane in Langley Tank No. 2 and on an Outdoor Catapult. NACA Wartime Report L-618.

5. Fisher, Lloyd J., and Steiner, Margaret F.: Ditching Tests With a One-Twelfth Size Model of the Army B-26 Airplane in NACA Tank No. 2 and on an Outdoor Catapult. NACA Wartime Report L-619.

6. Fisher, Lloyd J., and Steiner, Margaret F.: Ditching Tests With a One-Sixteenth Size Dynamic Model of the Army B-24 Airplane in Langley Tank No. 2 and on an Outdoor Catapult. NACA Wartime Report L-620.

7. Tarshis, Robert P., and Stewart, Thelma: Ditching Tests With One-Sixteenth Size Models of the Army B-17 Airplane in Langley Tank No. 2 and on an Outdoor Catapult. NACA Wartime Report L-621.

8. Jarvis, George A., and Kolbe, Carl D.: Ditching Tests of a One-Eighth Size Model of the Navy SB2C-1 Airplane (Army A-25) in Langley Tank No. 2 and on an Outdoor Catapult. NACA Wartime Report L-622.

9. Steiner, Margaret F.: Ditching Behavior of Military Airplanes as Affected by Ditching Aids. NACA Wartime Report L-647.

Four at Wright

Postwar activity brings developments in big powerplants, with compound engine of particular interest.

Four high-horsepower engine projects have given Wright Aeronautical Corp. a balanced powerplant program that includes types most likely to be in top military and commercial demand for the next few years.

After a postwar lull, Wright within a few weeks has issued announcements on three of the engines. Information on the fourth awaits Air Force clearance. This is the 5000 hp. T-35 turboprop, already in production (AVIATION WEEK, Mar. 29).

The others are the stepped-up R-3350, now developing 2700 hp.; the XJ-37, Lockheed-Menasco turbojet, on which Wright will complete testing and possibly start production, and the "Turbo-Cyclone 18" compound engine.

▶ **Bright Promise**—Like the others, the compound engine has been several years in development. Although not yet flight tested, it has shown sufficient promise in tests to stand out as possibly the next step in the evolution of reciprocating engine performance.

While the Air Force—with its emphasis on straight jet—reportedly lost interest in compound engine development months ago, the Navy still pursues the subject and may be sponsoring the Wright project. Advantages of the compound engine tie in closely with the Navy's plans for long-range patrol planes.

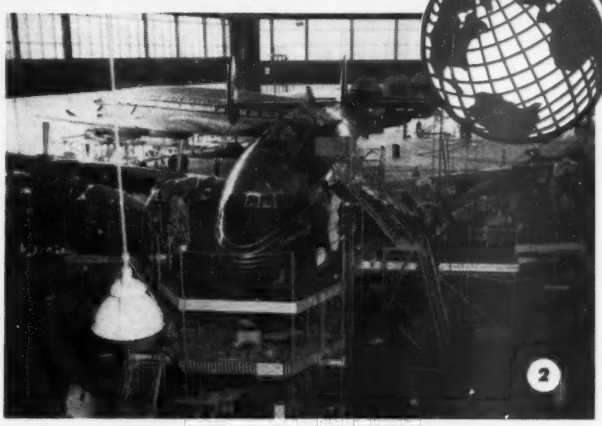
▶ **Low Fuel Consumption**—Big benefit of the compound engine is strikingly low fuel consumption at altitudes where conventional reciprocating engines pay a terrific penalty in fuel. For example, a compound engine is estimated to use .32 lb. fuel per hp. per hr. at 30,000 ft. compared to .85 for a conventional engine at the same altitude. Result is that the compound engine will either boost power 20 percent or cut fuel consumption by the same amount.

The compound engine has one or more turbines, turned by exhaust gases, geared to the engine crankshaft. Wright uses a 3350 engine, at the rear of which are three light-weight turbines. Individual exhaust stacks from the engine pipe the gases against these turbines in what is known as the "blow-down" method. Another method of compounding investigated is the use of a collector ring which exhausts against the turbine.

▶ **Overall Saving**—As Wright points out, the conventional reciprocating engine loses through its exhaust about one-half the energy in the fuel. While the compound system adds weight to the engine, the increased efficiency means this is a small handicap. Using four compound engines, Wright explains, a transport on a 10-hr. flight would save 600 gal. of fuel. Charged against this 3600 lb. weight would be about 2000 lb. of added engine weight. Net gain in usable weight would be about 1600 lb.—equivalent to eight additional passengers or 200 miles additional range.

Because of this, Wright envisions commercial as well as military demand for its compound engine. On the military side, the company asserts that the Navy's P2V Truculent Turtle (powered by two R-3350s), which established a nonstop distance record of 11,236 miles, could have flown 13,483 miles if equipped with compound engines.

PAA



1. The Clipper America, one of Pan American's fleet of Flying Clippers, takes off from New York City. 2. A Pan American Lockheed Constellation gets a thorough check at LaGuardia Airport. 3. Checking an engine on a Pan American Clipper at the Atlantic Div. base.

THERE'S GLAMOUR AND ADVENTURE in the sight of a Pan-American Flying Clipper soaring gracefully across an ocean . . . but to the men who understand the complex problems of airline operations, those swift, safe flights are the direct result of painstaking, exacting servicing and maintenance work.

Similarly, the test flight of a giant new aircraft is equally thrilling . . . but aircraft designers and builders appreciate the countless details of design and construction that made that test flight successful.

The widespread use of OSTUCO Aviation Tubing is typical of the importance of details . . . the inherent strength-without-weight advantages, the precision craftsmanship, the continuous product improvement research and the record of on-time delivery are details that serve to make OSTUCO Aviation Tubing the logical choice.

THE OHIO SEAMLESS TUBE COMPANY

Plant and General Offices: SHELBY, OHIO

SALES OFFICES: CHICAGO, Civic Opera Bldg., 20 North Wacker Dr. CLEVELAND, 1328 Citizens' Bldg. • DETROIT, 2857 E. Grand Blvd. HOUSTON, 927 A M & M Bldg. • LOS ANGELES, Suite 200-170 So. Beverly Drive, Beverly Hills • MOLINE, 225 Fifth Avenue Bldg. • NEW YORK, 70 East 45th St. • PHILADELPHIA, 1413 Packard Bldg., 15th & Chestnut • ST. LOUIS, 1230 North Main St. • SEATTLE, 3205 Smith Tower • SYRACUSE, 501 Roberts Ave. • CANADIAN REPRESENTATIVE: Railway & Power Corp., Ltd., HAMILTON, MONTREAL, NORANDA, NORTH BAY, TORONTO, VANCOUVER and WINNIPEG.

designers • manufacturers of aircraft interior equipment and airframe parts

Style, Comfort and Convenience in Aircraft Interior Equipment and quality Airframe Parts are designing and manufacturing bywords at Weber.

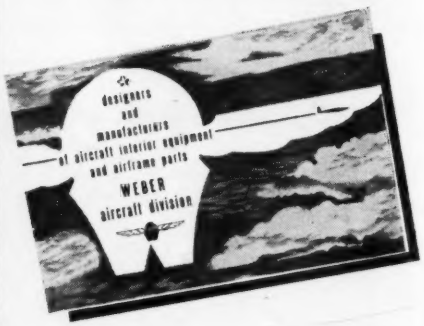
Leading airplane manufacturers and airlines using Weber's standard equipment, as well as equipment engineered to their exacting specifications, acclaim Weber's facilities as the finest in the field.

Today, in the Fiftieth Anniversary Year of the famous Weber Company, the Aircraft Division is an experienced, responsible organization fully staffed and equipped to handle the entire job of designing and fabricating every item pertaining to Aircraft Interior and Airframe Parts.

Your inquiry about our quality work, speedily and economically produced, is invited.

WEBER AIRCRAFT DIVISION
SHOWCASE & FIXTURE CO., INC.
2001 BELGRAVE AVENUE • HUNTINGTON PARK, CALIFORNIA

free illustrated brochure



Weber products . . . production methods . . . and background fully illustrated and described. Write for your copy on your company letterhead, please.

weber supplies leaders in the field of aircraft

★ passenger and crew seats

★ hostess lounges

★ tray carriers • wine boxes • cold food boxes • dry food handlers • drinking water tanks • washbasins • toilet seats and covers • drawer locks • ring latches • other standard or custom designed hardware and accessories.

★ aircraft interiors designed and custom built to specifications.

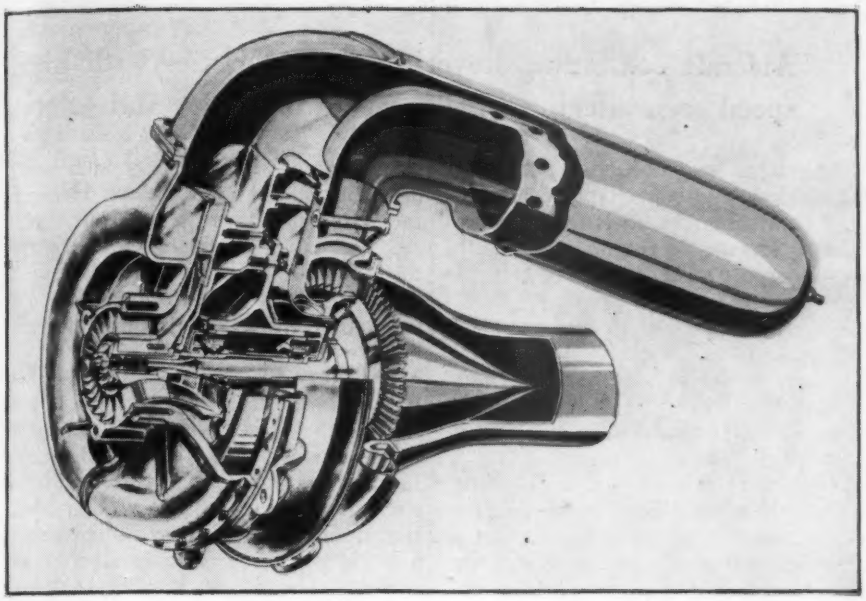
★ galleys and buffets.

★ wing tips • aircraft stampings cowls • nose wheel doors bomb bay doors • access doors bomb rack fairings • fuel and water tanks • compartment doors • other airframe parts and assemblies.

the right equipment for every job

world's finest equipped plant...

- Top engineers . . . designers
- on the spot tooling
- precision assembly
- accurate inspection
- processing and welding
- tool and production planners
- tool engineers and mechanics
- expert schedulers



From Supercharger To Turbojet

Small jet engine now being tested for military use, with lightplane application possible.

By SCHOLER BANGS

A turbojet engine developed from a surplus supercharger is being tested as a power source for high-speed radio-controlled Navy target planes. It now produces 280 lb. thrust at 26,000 rpm.

Edward West, Jr., who heads up West Engineering Co., Inc., which constructed the engine, hopes to develop it to the point where it will deliver 400 lb. of thrust to permit its use in a jet-powered personal plane.

▶ **Started Two Years Ago**—Being cognizant of the thrust-producing potentialities of the airplane turbosupercharger, West began a development project two years ago, after obtaining 6000 unused war surplus Type B airplane superchargers.

The Navy became interested and placed with West an experimental development contract for three engines, one of which is on the company's test stand at Van Nuys, Calif. Another is undergoing runs at Pt. Mugu Air Missile Test Center laboratories.

▶ **Conversion**—As shown in the accompanying cutaway drawing, modifications converting the supercharger into a turbojet engine consist mainly of the attachment of a single reverse flow combustion chamber, a special injector nozzle, and intake and exhaust ducts. Dry weight of the engine is 175 lb.

To improve turbine efficiency, West has discarded the supercharger's standard blades, 144 in number, and has replaced them with blades of improved aerodynamic configuration. These were designed by Dr. William Hawthorne, Professor of Mechanical Engineering, Massachusetts Institute of Technology. The new blades are produced by a Los Angeles precision casting firm, employing the "lost wax" casting process, at a cost of $1.44 per bucket or about $208 per turbine wheel.

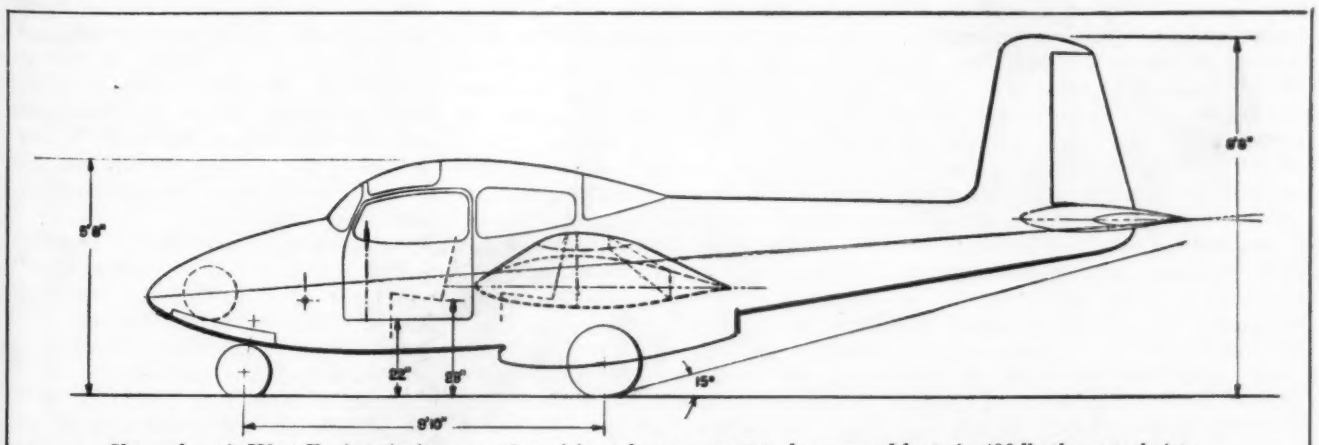
While West quotes an initial price of $2800 to the Navy for first production units, he feels that in mass production the supercharger engine can be made to sell commercially for close to $1200.

▶ **Target**—West feels that an improved model, further modified by replacing the air intake inducer section with new inducer blades of greater depth and new configuration, will be productive of the full target power of 400 lb. thrust.

Specifications for the 400-lb.-thrust engine call for a specific fuel consumption of 1.3 lb. fuel per lb. thrust per hr. This indicates a volumetric consumption of 75 gal (kerosene) per hour at 400 lb. thrust, comparing favorably with the fuel rate of larger jet engines.

Interested in the West development as a light racing plane powerplant is C. L. Wolford, former Air Force holder of the Los Angeles-San Francisco jet speed run. He is considering the design of a twin-jet racer, using West engines, which might compete with heavy jets in the National Air Races and also serve as an air show exhibition plane.

▶ **Plane Design**—On the basis of ultimately achieving the higher thrust with his small turbojet, West envisages a four-place transport designed to produce a top speed of 360 mph. and using two of the engines for takeoff power. At altitude one engine would be cut off to reduce fuel consumption and permit ranges of 450 mi. at 250 mph., or 500



Shown here is West Engineering's conception of four-place transport to be powered by twin 400-lb.-thrust turbojets.

mi. at estimated speed of 200 mph.

The design specifications call for an airplane of 5020 lb. initial gross weight, and capable of taking off and clearing a 50-ft. obstacle in 1800 ft. Initial climb would be 2000 ft. per min.

West believes that such a plane might be built to sell for $7000. It would be non-pressurized and would be designed to cruise at 10-12,000 ft.

C-W Reported Set For Business Boost

Curtiss-Wright Corp. has achieved financial and physical stability that puts it in a "good position" to meet any expansion of government procurement, President Guy W. Vaughan asserts in his annual report to stockholders.

Despite a 1947 net loss of $1,365,258, C-W wound up the year in solid financial shape, with working capital of $103,340,957—more than $75,000,000 in cash and short-term government securities. Sales increased from $71,984,015 in 1946 to $83,161,988 last year, although the report cites "serious engineering difficulties in bringing out five new models of hollow steel propeller blades." This was a major factor in the year's deficit.

▶ **Backlog Increase**—Possibly related to the situation in the propeller division is the fact that C-W's backlog increased during the year at the same time shipments were rising. Unfilled orders as of Dec. 31, 1947, were valued at $118,500,000 (80 percent military), compared to $115,000,000 at the close of the preceding year.

Bulk of 1947 shipments apparently were credited to the engine subsidiary, Wright Aeronautical Corp., which reported sales of $51,260,548, on which it realized a net profit of $512,600 after a tax carryback credit of $1,858,000 and transfer from reserves of $773,000.

▶ **Airplane Division**—Work at C-W's other aeronautical enterprise, the airplane division at Columbus, was featured by completion of the XP-87 all-weather jet fighter. During the year this division discontinued work on the CW-32, four-engine cargo plane, after finishing the mock-up and engineering. Suspension of the project was due to lack of government financing for its development. This was not unexpected, as C-W has never made any secret of the fact that the plane will be built only when contracts covering costs are in sight.

Operating loss of the company for 1947 was $9,697,791. A claim for a tax refund under the loss carryback provisions of the Internal Revenue Code reduced this to $2,288,791. Deficit was further reduced by transferring $937,000 from postwar contingency reserves.

Convertaplane: Key to Speed Range

Aircraft combining hovering characteristics with high speed seen offering wide measure of utility and safety.

Engineers are devoting increasing attention to the convertaplane, an aircraft combining the hovering and slow-landing features of the helicopter with the high-speed characteristics of the conventional airplane.

Such a combination of features offers interesting and attractive possibilities not only as a means of increasing the utility and safety of the passenger plane but as a military weapon in the guided missile field.

These possibilities are now being studied on a broad front and numerous experimental aircraft and models incorporating these unusual features actually have been test flown over the past decade.

▶ **NACA Study**—The Aerodynamics Committee of the National Advisory Committee for Aeronautics studied the possibilities of the convertaplane about a year ago. Following a special subcommittee study, it recommended, last November, further examination of the configuration.

Purpose of the study is to determine the most promising combination of features and analyze the type and amount of research needed to bring it to the practical stage. Wind tunnel tests, at nearly full scale, of several configurations now are being planned.

The convertaplane presents several basic problems, which only an extensive research and development program can solve. The three outstanding problems of such a configuration are:

- How to stop and start a rotor in flight.
- How to make a rotor efficient as a propeller.
- What is the best combination of features?

The first problem is largely a mechanical one, for which numerous solutions have been offered, several having proved practical in actual flight tests.

The second problem will require a research program requiring extensive facilities, such as those operated by NACA.

A study of the third problem reveals that the possible combinations fall into six broad categories:

▶ **1. Rotor Blades Become Fixed Wings**—This design is a conventional helicopter in which the rotor blades may be stopped in flight normal to the flight direction and act as a conventional fixed wing. When desired, the rotor would be released to rotate, the craft becoming a conventional helicopter for hovering to a vertical landing.

These principles actually have received extensive flight tests in a craft designed and built by Gerard Herrick, the father of convertible aircraft. Herrick's craft has demonstrated its ability to fly both as a fixed wing biplane and as a gyroplane with the upper wing free to rotate. Herrick is continuing his work in New York.

▶ **2. Rotor Blades Streamlined**—This type is similar to that of category 1, except for the stowed position of the rotor longitudinally instead of laterally. One form is a single-blade rotor with a streamlined weight on the other end, the rotor locked in the longitudinal position when the craft operates as an airplane. The weight may be replaced by a small jet engine to provide rotation of the blade.

This configuration has been proposed by Inventor Antoine Gazda, Providence, R. I. (AVIATION WEEK, Sept. 15, 1947). He would install a large rotor experimentally on a Douglas DC-3 transport. The rotor lies along the top of the fuselage when not in use.

This is the type urgently recommended to the Navy for work on carriers, battleships and cruisers, since it requires no catapult or arresting gear to operate from the restricted area of a combat ship.

When sufficient forward speed has been obtained so that the fixed wing can carry the load of the machine, the power is shut off from the rotor, which weathercocks into position along the fuselage. The wing is set at approximately six degrees to the plane of the rotor so that the wing will assume the load when the rotor disk is parallel to the line of flight.

▶ **3. Retractable Rotor Blades**—Although this type will require extensive mechanical development, Vittorio Isacco has already done considerable experimental work in England on mechanically retracted rotor blades. In this arrangement, the fixed wing area and control surfaces are of minimum size and the diameter of the rotor is controlled by the speed of the airplane, the rotor tip speed remaining constant during conversion.

▶ **4. Rotor and Body Swing Together**—This is one of the simplest mechanical types of convertaplanes, although the aerodynamics of stability and control will require extensive research. The form was originally suggested by Lloyd Leonard of New York during his work at NACA. In this configuration, the craft rises vertically to the desired altitude, at which point it simply rolls over

and moves forward with the rotor acting as a conventional propeller. Interest in the arrangement is widespread, with actual development work now under way by the General Electric Co. (AVIATION WEEK, Nov. 3, 1947).

Under the direction of Lavid Prince, GE began experimental work during the latter part of the war on a design with a wingspan of 40 ft., and a 35-ft. rotor mounted in the tail. The convertaplane climbs and hovers at about 100 rpm. and in level flight is claimed to reach a speed of 200 mph. with the rotor turning at only 80 rpm.

This type has also aroused the interest of Arthur Young of the Bell Aircraft Corp. and he has made several successful flying models.

▶**5. Rotor Pivots in Relation to Body**—This design is urged for immediate development because of its technical feasibility with present knowledge. The axis of the rotors is rotated 90 deg., enabling the craft to ascend and descend vertically while the fuselage remains in the normal horizontal position. After reaching the desired altitude, the rotors are turned forward, in which position they act as conventional propellers.

This plan was suggested by Louis De Monge in France and by Laurence LePage in this country. Several U. S. aircraft manufacturers have considered this arrangement feasible for a military type for use with the Army Ground Forces, both as a ground cooperation machine and as a short-haul transport. With very little modification, several current experimental laterally-opposed helicopters could be modified experimentally to test this configuration.

▶**6. Rotor Blades Change Axis of Rotation**—In this case, the rotors are operative during climb and hovering action, but are slowed to a stop to comprise fixed wings for high-speed level flight. This type is adapted particularly well to jet propulsion and was studied by Dr. Focke in Germany during the war. It shows considerable promise as a supersonic guided missile capable of vertical launching from any convenient platform and of hovering over the target and landing vertically. It also has interesting possibilities as a defensive missile, hundreds of them hovering over a strategic target after being dispatched there by a central control station.

First step in the future development of the convertaplane must be the selection of one or two of these designs as offering the most immediate practical possibilities. Others showing promise should be examined carefully for the type and scope of research and development program required for their perfection.

While there is little doubt that individual inventors and aircraft companies will continue the development

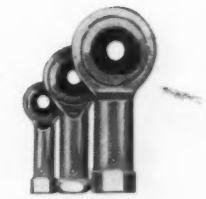
ADEL PRECISION PRODUCTS CORP.

Rx for design engineers with mis-alignment problems

HALFCO SPHERICAL CONTACT SELF-ALIGNING BEARINGS

Maximum 10 degree permissible mis-alignment ...ability to withstand ultimate static bearing loads to 700,000 lbs...shock resisting characteristics. These features make the Halfco bearing the answer to your design problems. The Halfco bearing consists of a heat-treated, hard chrome-plated, highly polished steel ball around which an outer race of hard bronze is integrally formed. This full spherical surface contact allows extremely heavy loading and resists both axial and radial forces. The self-aligning and axial thrust capacities make the Halfco bearing far superior to plain journal bearings. A 360 degree oil groove assures positive lubrication. Various sizes permit a wide variety of design possibilities.

Halfco rod end bearings are ideal for mechanical linkage systems. They may be used as ball joints, rod ends on actuating cylinders, or in linkages to accommodate motion in more than one plane.



BRIEF SPECIFICATIONS

Ultimate static load capacities, lbs.	3,500 to 700,000
Bore sizes	.1895" to 3.000"
Permissible mis-alignment	approx. 10°

Write for catalog containing complete specifications. Address 10727 Van Owen Street, Burbank, California.

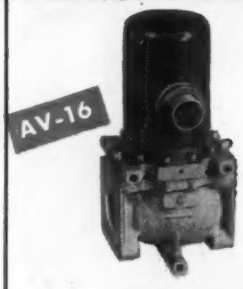
ADEL

HALFCO BEARINGS are manufactured with either aluminum bronze or steel races in a wide variety of sizes.

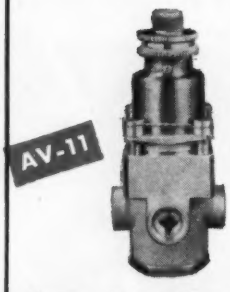
ADEL PRECISION PRODUCTS CORP.
BURBANK, CALIF. ★ HUNTINGTON, W. VA.

Manufacturers of: Aircraft Hydraulic Systems • Marine & Industrial HSOdraulic Controls • Halfco Self-Aligning Bearings • Line Support Clips and Blocks • Industrial Hydraulic Equipment • Aircraft Valves • Industrial Valves

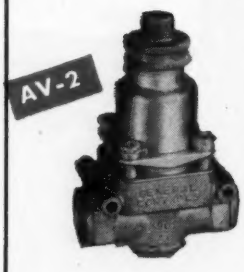
SPECIFY GENERAL CONTROLS
hi-g* valves for aircraft
AUTOMATIC PRESSURE, TEMPERATURE AND FLOW CONTROLS



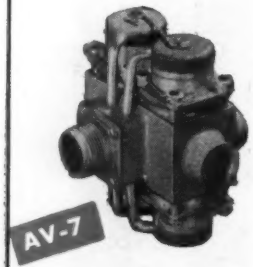
Electric motor valve, suitable for fuel, hydraulic fluid and lubricating oil shut-off. High flows at low pressure drop, explosion-proof motor and switch cover.



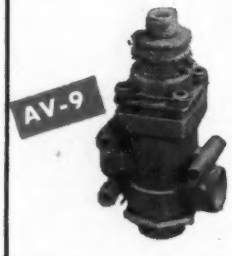
3-way Electro-Magnetic valve used for distribution of fluid flow or for "feed in" and "exhausting" fluid from a cylinder, piston or vessel.



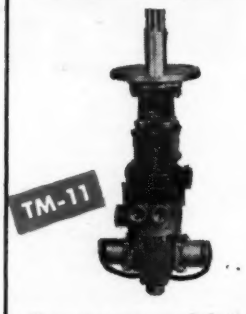
Same as AV-1 except is normally open type. For control of various fluids, oil, water, gasoline, air, etc.



Four-way selector type control—operating pressure up to 3000 P.S.I. for control of fluid pressure operated cylinders.

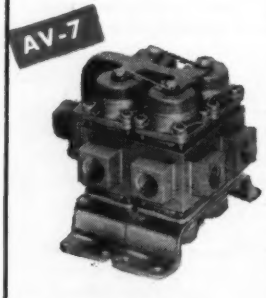


Electro-Magnetic valve for medium and high pressure applications. Controls hydraulic oils, fuels, lubricating oils, water, etc. 50 P.S.I. to 3000 P.S.I. operating pressure.



Temperature modulating control—providing fully automatic electro-hydraulic operation for control of engine coolant and lubricating oil.

Normally closed type Electro-Magnetic valve—for control of all types of fluid, gasoline, air, water, hydraulic fluids or oils, anti-icing fluids, etc.



Electro-Magnetic Double-Four Way selector type valve for control of fluid pressure operated cylinders.

Electro-Magnetic type valves with various magnet sizes, full ported or restricted ports, for all types of fluid, gasoline, air, water, oils, etc.

For complete specifications and engineering data, request new Catalog.

*hi-g TRADEMARK 36-2

hi-g GM C
GENERAL CONTROLS
Manufacturers of Automatic Pressure, Temperature & Flow Controls
FACTORY BRANCHES: BIRMINGHAM (3), BOSTON (16), CHICAGO (5), CLEVELAND (15), DALLAS (2), DENVER (10), DETROIT (8), GLENDALE (1), HOUSTON (2), KANSAS CITY (2), NEW YORK (17), PHILADELPHIA (40) PITTSBURGH (22), SAN FRANCISCO (7), SEATTLE (1) • DISTRIBUTORS IN PRINCIPAL CITIES

until a successful convertaplane is created, the problems are so complex and the costs are so great that only the military are in a position to accelerate this development in the shortest possible time. The advantages of the type are too great, however, to permit any delay in the fullest exploitation of its potentialities.

Aluminum Production

Plane builders can stop worrying about an aluminum shortage of any magnitude. By the time they are ready to roll on the 1949 orders the light metal supply situation should be back to normal.

As it stands now the two-thousand-odd military planes to be procured in fiscal 1949, plus any extras that Congress adds to the Truman budget, will call for less than 5 percent of total U. S. light metal production. Although aluminum producers have been plagued with a series of bottlenecks during the past six months, they look to a return to normal late this year.

▶ **Output Up**—By the time plane makers are ready for line production output will be back up to 1.4 billion lb. a year, which should supply most of the U. S. demand for the metal. Any deficit could be more than made up by Aluminum Co. of Canada, which has been operating this year at about half capacity. By the end of the year the Canadians will be close to full production and able to supply any amount of the metal to the U. S.

Even if demands for a 70-group Air Force are heeded by Congress, and the aircraft industry is capable of producing the 6800 planes needed to bring the force to that level, the demand for plane aluminum would only total about 150,000,000 lb, or about 10 percent of U. S. production.

▶ **Sheet Plentiful** — Sheet aluminum should be in plentiful supply next year and in wider sizes than heretofore. ALCOA's new Davenport, Iowa, plant alone could turn out all the sheet needed by the plane makers in six months.

Posy Poser

THE HAGUE (via London)—Experimenters in Wageningen, working on problems of temperature and relative humidity important to air transportation of cut flowers, report that favorable results from use of various materials to delay growth point to new possibilities in air carriage of these perishables. The tests are being made in the laboratory of the Institute of Research on Vegetables and Fruits in cooperation with the Scientific Bureau of KLM (Royal Dutch Airlines).

Airline Executives...

How Much Capital Must You Invest

in Maintenance Facilities?

Is it good business to burden your airline with heavy capital investments in maintenance facilities—perhaps to the detriment of plans for route expansion or other enlarged operations?

Or is it better business to specialize in *operation* ...and turn *upkeep* problems over to PAC, whose strategically located shops are completely equipped for production-line service?

Every one of the airline clients of Pacific Airmotive Corporation benefits from its participation in PAC *volume maintenance.* In serving many operators, PAC reaches a volume which would be impossible for any single airline to attain. Volume is the secret of low costs—and is the reason why airlines can purchase service from PAC at prices equal to or lower than their own costs. PAC volume is growing, and so are benefits to airlines.

PAC offers maintenance and contract overhaul on engines, accessories, props, and instruments. You can drastically reduce your capital investments in buildings, expensive tools, and inventories—and still obtain prompt, top-quality service—through use of PAC's high-volume facilities.

PAC SERVES THE WORLD'S AIRLINES

Consult your nearest major service base for additional information

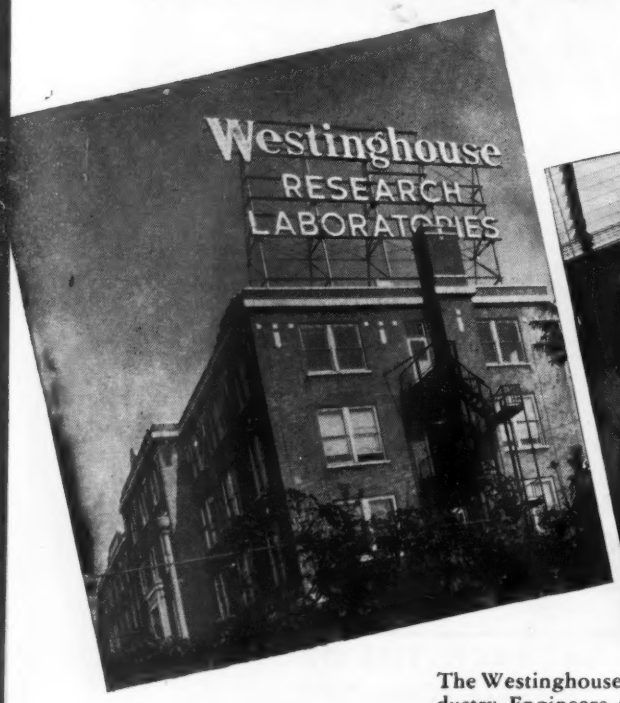
ANCHORAGE, ALASKA
BURBBANK, CALIFORNIA
KANSAS CITY, KANSAS
LINDEN, NEW JERSEY
OAKLAND, CALIFORNIA

PACIFIC AIRMOTIVE *corporation*

Executive offices at 2940 N. Hollywood Way, Burbank, California

Cable Address: PACAIR, LINDEN ★ PACAIR, BURBANK

Here's Teamwork...



Center of all Westinghouse research activities is the laboratory at East Pittsburgh where a staff of 200 explores new and better methods of solving the problems of aviation.

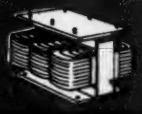
The Westinghouse Aviation Industry Engineers travel in the field to act as consultants on special aircraft problems.

COURTESY BOEING AIRCRAFT CO.

Westinghouse research, engineering and modern production facilities produce the electrical equipment that contributes to the fine performance of today's planes.

11 MANUFACTURING PLANTS... VAST FACILITIES CO-ORDINATED TO PRODUCE BETTER AIRCRAFT EQUIPMENT

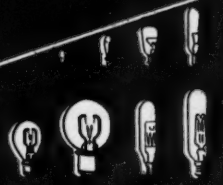
BALTIMORE



SHARON

NEWARK

CLEVELAND



BLOOMFIELD

That promises new achievements in aviation . . .

. . . and better aircraft products for you

Teamwork is the secret of Westinghouse superiority in a wide range of aircraft products. Teamwork in the form of co-operative engineering and manufacture between 11 plants co-ordinated with one another and through a central headquarters. And in these vast resources lies an important advantage for you. For here are the knowledge, the experience and the facilities to engineer and produce better aircraft products . . . faster and at minimum cost.

Westinghouse equipment for the aviation industry covers a wide range of mechanical and electrical units or parts, for both ground and air-borne application. And all of this equipment —from tiny aircraft lamps to powerful turbo-jet engines and from radio and radar to giant wind tunnels—is contributing to safer, swifter and more comfortable flight.

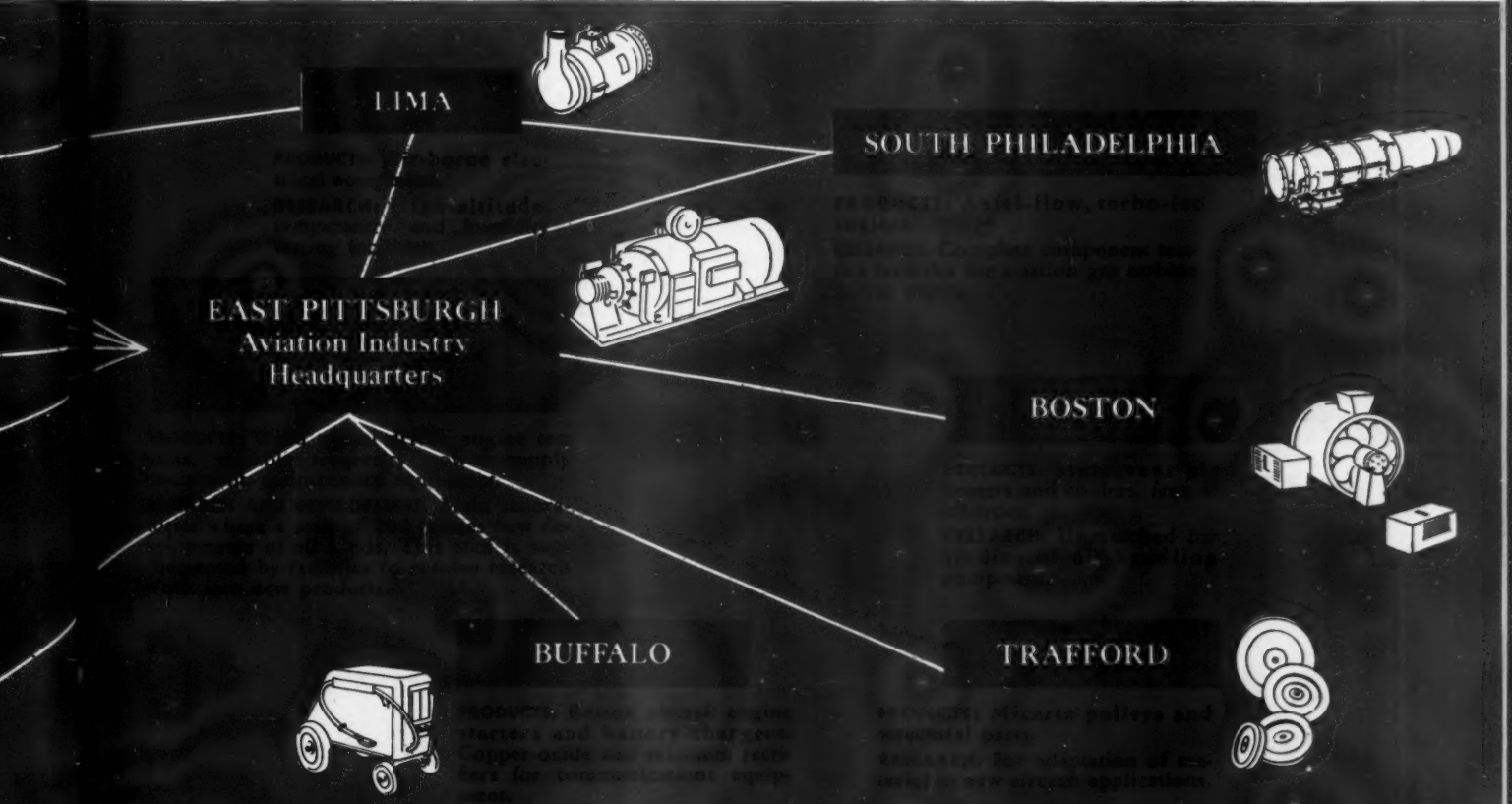
The illustration below indicates the magnitude of the Westinghouse organization and how it is harnessed together to assist the aviation industry toward even greater achievement in the realm of flight.

This is why Westinghouse is your best source of supply for your aviation needs. For the complete story on "Westinghouse in Aviation" ask for your copy of Booklet B-3775. Call your local Westinghouse office or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-94760

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Leader in Aviation Equipment



NEW AVIATION PRODUCTS

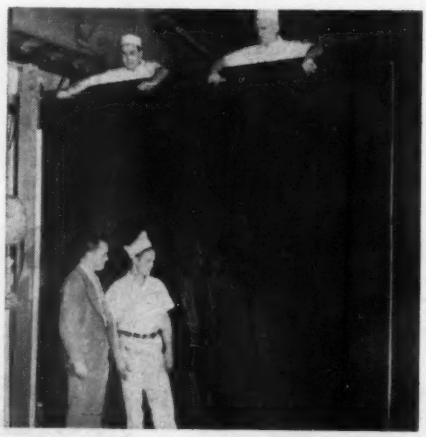
Hydraulic Test Equipment

Affording various uses to small airport operators is portable hydraulic tester Model PE 1-1½ made by **Greer Hydraulics, Inc.**, 454–18th St., Brooklyn, N. Y. Unit incorporates 4½-gal.

reservoir and strainer, 2-hp. electric motor, hydraulic pump rated at 1.5 gpm. at 1599 psi., relief valve, pressure gage, check valve, and pressure and return shut-off valves and outlets. Operation is via connection to source of electric power.

Extra-Large Plastic Sheets

Affording large-dimension applications thus far restricted to other materials or segmented constructions, new acrylic plastic sheets measuring 100 by 120 in. are offered by **Rohm & Haas Co.**, Philadelphia, Pa., for use as transparent sections in aircraft installations. Over 83 sq. ft. in area, sheets are stated to have less thickness variation than company's previous largest sheets.

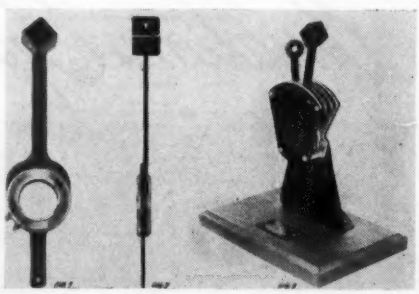


Airport Paint

Offering various uses at airports and in associated buildings, synthetic paint, marketed by **Lowevco, Inc.**, Chicago, Ill., dries to hard, glossy finish in 3 to 4 hr. and seals concrete surfaces from moisture. It can be used on floors and walls of hangars and for marking runways and landing strips. It is claimed to expand and contract easily with material covered, and to resist chemicals and extreme heat or cold. Gallon covers from 300 to 600 sq. ft. on first coat, depending on porosity of material, and approximately 700 sq. ft. on second coat.

Throttle Control

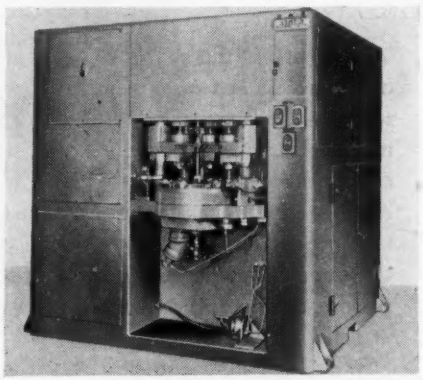
Intended to overcome vibration-induced setting changes which occur while aircraft is in flight is new self-locking control offered by **Lynn Co.**, 800 So. Flower St., Burbank, Calif. Due to locking feature above load inherent in control system, device does not increase load on knob. Takeoff lever is immovable, but actuation of primary or knob lever permits free movement of secondary or take-off lever. Movement of control is instantaneous, without necessity of releasing



locks or latches. Claimed to be adaptable to all types of aircraft, unit fits standard 1½-in.-dia. quadrant hubs and may be utilized in single or multiple control quadrant assemblies. Device may also be incorporated in standard types of brackets and combined with mixture control levers.

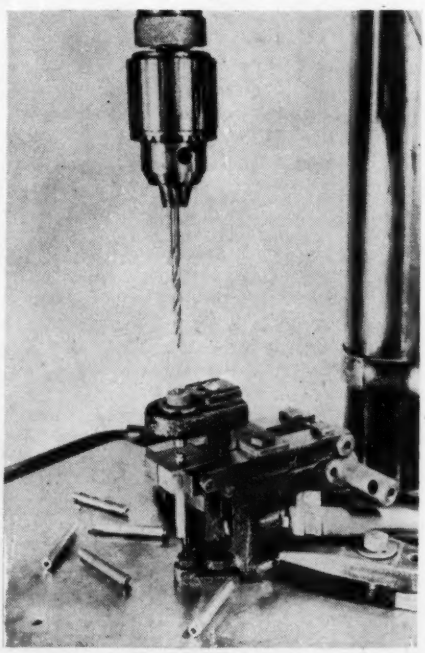
Assembly Press

Hydraulic machine, HCP3-5, designed for assembly of one-piece sparkplugs, is also adaptable to progressive welding and forming operations. Maker is **Agnew Electric Co.**, Milford, Mich. Foot-controlled device incorporates table with six stations indexing 60 deg. by hydraulic motor. Speed of deceleration and acceleration of indexing is adjustable by means of flow valve. Individual pressure adjustment for each of three rams is provided. Pressures up to 8 tons are claimed. Hydraulic controls are isolated from electrical components. Double-volume pump is driven by 15-hp. motor to provide fast speed of rams and pressures up to 1000 psi. Machine weighs 10,000 lb., occupies 60 x 60 x 60-in. space.



Drilling Fixture

To facilitate aircraft production and repair schedules, Universal Part Holder, offered by **Mueller Industries**, 4755 N. Rockwell St., Chicago, Ill., is intended for drilling, milling, tapping, threading, counterboring and similar operations which can be executed manually or by mechanical means. Clamping is adjustable for location and pressure. Jaws have maximum opening of ⅞ in. permitting part to be held behind shoulder. Holder will handle work up to 1 in. round or hex, and irregular-shaped pieces within that range. Drill sizes up to ½ in. can be used, and unit can accept, interchangeably, standard A.S.A. drill bushings. Height of bushing from work is adjustable, allowing for chip clearance and also for sufficient coolant entry.



FOR YOUR CONVENIENCE . . . A COMPLETE

SHERWIN-WILLIAMS COLOR LINE!

19 carefully selected colors—plus black and white—in the complete Sherwin-Williams Aircraft Color Line! And all of them are available in four types of finish: Opex Pigmented Nitrate Dope, Opex Pigmented Butyrate Dope, Opex High Gloss Lacquer, Kem Synthetic High Gloss Enamel.

Offering color matches for most aircraft manufacturers' standards, the colors in the Sherwin-Williams line have been chosen for their purity, richness, cleanness, brilliance . . . and outstanding durability. Pigments are pure struck colors, free from any tinting (except where hue is lightened by addition of white).

In addition to this comprehensive color line, Sherwin-Williams offers other finishes for every aircraft and airport requirement. The Sherwin-Williams Co., Aircraft Division, Cleveland 1, Ohio. (Export Division, Newark, N. J.)

Distributed by Pacific Airmotive Corporation

Products of Sherwin-Williams Industrial Research

SHERWIN-WILLIAMS
AIRCRAFT FINISHES

SALES & SERVICE

Early 1948 Sales of Lightplanes Foreshadow Low Total for Year

Veterans flight program, and new four-placers yet to be marketed, are unpredictables which may change the outlook. Procurement of trainers also a factor.

By ALEXANDER McSURELY

Total 1948 personal plane sales may be even slimmer than forecast—if the first two months are any indication.

The 13 leading lightplane manufacturers in the Personal Aircraft Council report sales for January and February combined of 904 planes. By the end of February last year, virtually the same companies had shipped more than four times that many.

▶ **February Low**—February, this year, saw the smallest shipment total since early postwar days: 441 planes. Two years ago that would have been only a fair one-month production rate for any one of three leading personal plane manufacturers. January, 1948, shipments totaled 463, including one Aeronca L-16 liaison plane shipment in addition to the civilian planes.

Preliminary forecasts for 1948 estimated total personal plane production somewhere between 8000 and 12,000. But even assuming the February production figure is the low mark of the year, all remaining months' sales must average better than 500 if the year's sales are to reach the 6000 mark.

▶ **Training Key**—Major factor in the 1948 sales picture, still not predictable, is the veterans' flight training program, currently under discussion in the House Veterans' Affairs Committee. If the program is considered vocational, and continued at near its present level, a fair volume of trainer sales may be expected. But if the not-inconsiderable opposition to continuing large scale GI flight training, is successful, the training plane market picture will be dark gray.

It could be brightened, however, by another unpredictable: increased military and naval procurement funds. Air Force presently has out a design competition for trainer planes. Several manufacturers have high hopes that any step-up in procurement will include a large chunk for training planes.

▶ **Stinson Again Tops**—Stinson regained leadership among individual companies, with 105 four-place Voyagers shipped in February, an increase of five over the even 100 delivered in January. Cessna, which nosed into first place in January with 108, reported only 90 planes for February. Luscombe reported 64, a gain of two over its January shipment, for third place, Beech with 63 Bonanza shipments was a close fourth in volume, and second only to Stinson in dollar volume.

Ryan showed most impressive February increase in the list from 23 in January to 41, indicating that the San Diego company's Navion production is now rolling in good shape, and that Navion is again a serious contender in the four-place field.

▶ **Eyes on March**—March personal plane production figures, not yet available as this analysis is written, will throw further light on the uncertain market. If the March total continues the downward trend, which has been uninterrupted since last September, the dim forecast will be further confirmed. If, however, the market stabilizes, or totals make an increase, however slight this may be, the outlook will obviously brighten, as the good-weather flying season approaches.

Still another uncertainty at this point is the effect that the introduction of several new four-placers, expected in April and May, will have on the total sales. Analysts are watching to see whether they will cut in on the sales of existing four-placers, or will find additional markets, at the lower prices which have been announced for them.

Alabama Airmarking

The Alabama Department of Aeronnautics has awarded a contract for the painting of 154 air markers in 139 Alabama towns to the Air Marking Co., Rochester, Ind. Cost will be $9979.25.

Work will start on or before April 1, and is to be completed by Aug. 1. Standard CAA air markers will be painted. Markers on the Skyway 1 will have Skyway insignia.

SALES ROUNDUP SEES NEW POLISH

R. M. Hollingshead Corp., Camden, N. J., recently sent out the factory-owned DC-3 to pick up its distributors' representatives for a two-day sales clinic at the home plant. Photo shows the distributors and representatives being welcomed at the Hollingshead plane on arrival by Sales Manager Fred Lee. Later, they saw how a new version of a Hollingshead polish for metal planes takes "less elbow grease." After a mechanic instructed them in the latest improved methods of polishing, the sales representatives made their own tests by applying the polish to an Ercoupe. Seven distributors were represented at the clinic.

ON RUNWAYS

BENDIX LANDS THE LEADERS

LEADING AIRCRAFT USING *Bendix* LANDING GEAR EQUIPMENT

Douglas DC-3 • Convair 240 • Lockheed Constellation • Boeing Strato-Cruiser
Beech 2-Engine Transport • Douglas Skystreak • Vought F6U-1
Republic P-84 • Grumman F8F • Consolidated B-36
North American B-45 • North American P-86
Boeing B-50

Bendix is proud of its partnership with the leaders in aviation progress. For the world over, you'll find Bendix* Landing Gear at work—making landings smoother, safer, shorter. Long and close cooperation between Bendix and the foremost plane manufacturers has given Bendix a background of practical engineering experience unparalleled in the industry. Next time *you* face a landing problem—PLAN WITH BENDIX—because Bendix Lands the Leaders!

PLAN WITH BENDIX

for *everything* in Landing Gear Equipment: Main wheels, brakes, tail wheels, nose wheels, main and nose struts, power brake control valves, master cylinders.

BENDIX PRODUCTS DIVISION *of* SOUTH BEND 20, IND.

Bendix AVIATION CORPORATION

*REG. U. S. PAT. OFF.

Bendix
PRODUCTS
DIVISION

$40,000,
for A

,000,000.
r Aviation by 1952

JANUARY 1, 1948 — **"We need a greatly enlarged air force, right now."** — *President's Air Policy Commission*

FEBRUARY 9, 1948 — **"U. S. policies must remain continually adjusted to the requirements of total air power."** — *Air Coordinating Committee*

MARCH 1, 1948 — **"We must have air power that is supreme. We cannot have less."** — *Congressional Aviation Policy Board*

FORTY BILLION DOLLARS . . . that's the amount of money required to rebuild U. S. air supremacy in the next five years. Our Administration, our Congress, our military and aviation leaders agree that we must do this if America, as the leading world power, is to maintain world peace and order.

Nor can we stop there. We must continue to spend, say our national leaders, $10 billion yearly to maintain this air supremacy.

One of America's greatest industries

"The air power we must have presages a vast new industry." These are the words of the Congressional Aviation Policy Board. Aviation will again become one of the largest of U. S. industries — larger than the giant automotive industry.

What this will mean to your business

The impact of $40 billion of aviation spending will affect every business in this country. Your planning, beginning now, must embrace the effect on your business of the innumerable product and service requirements of aviation.

The sales approach to the Aviation Market

Aviation is *one* industry, not many. As the Congressional Board expresses it, "National air power is an entity not fundamentally divisible as a weapon or as a carrier." Air power is the total aviation activity—military, commercial and private. This is the key to your aviation sales job.

How *Aviation Week* serves your sales requirements

Aviation Week was specifically designed to serve the information needs of *all* men in the aviation business. Its editors report every important development in the science of aeronautics and assess its effect upon all activities within the industry. Its editors also recognize the need for the greatest possible speed in the communication of aeronautical intelligence.

Aviation men must get all the news—and the meaning of the news—and they must get it fast. *Aviation Week* is the one aeronautical publication geared to match the need and the speed of aviation.

In the development of your marketing plans to serve this great U. S. industry, we submit *Aviation Week* as the most powerful single sales influence you could place behind your product.

McGraw-Hill Publishing Co., Inc., 330 West 42nd St., N.Y. 18, N.Y.

ABP **AVIATION WEEK** ABC

THE MAGAZINE OF AVIATION BUSINESS

Plane Pays Way

New evidence that specialized utility of a personal-executive airplane can show a direct profit comes from L. R. Martin, president of Northern Transportation Co., Los Angeles contract trucking concern.

He told AVIATION WEEK that the cost of his company's Navion, which he pilots, was more than returned in savings effected with the airplane on a single recent contract. This was to move 11,000 tons of explosives from a Marine Corps base at Barstow, Cal., to Navy's ammunitions depot at Hawthorne, Nev.

"Our truck loading and unloading costs were reduced almost to nothing per ton by virtue of my being able to fly Navy and Marine Corps officers of the two bases back and forth to meet each other directly and work out a detailed truck loading and scheduling program before movement of the munitions commenced.

▶ **Beat Schedule**—Differences between officers of the two military agencies were resolved in a way that couldn't have been accomplished by letters, telegrams, or long-distance phone calls. We completed our planning in 48 hours, and completed our contract, using 50 trucks, seven days ahead of the 30 days allowed under our contract."

Martin reports that in general use of the Navion, the time required for business calls is cut from 10 days, required by auto, to five days.

$5000 Soaring Fund

A record point award fund of $5000 has been announced for the 15th National Soaring Contest to be held at Harris Hill, Elmira, N. Y. June 30 to July 11.

Until this year the highest prize pool was $3000 offered at Wichita Falls, Texas, for the 1947 meet. Over 100 pilots are expected to compete.

In addition, there are standing offers made by the Elmira Area Soaring Corp., sponsors of the meet, of $1000 to any pilot breaking the national distance record, and $500 for an altitude record from Elmira.

Buffalo Aero Adds Space

Buffalo Aeronautical Corp. is adding 25,000 sq. ft. of floor space to provide for increased aircraft parts, accessory and overhaul activities. The additional space consists of hangar 5 at Buffalo Airport, which is being added to the company's present space in hangar 4. The firm has been designated by Continental Motors as an overhaul base. Additional skilled aircraft mechanics will be hired, according to vice president H. Leibee Wheeler.

BRIEFING FOR DEALERS & DISTRIBUTORS

TEMCO SWIFT ORDERS UP—Texas Engineering & Manufacturing Co., Dallas, is increasing production of the Swift 125 all-metal low-wing two-place personal plane, in order to meet increased sales orders, Robert McCulloch, president, announced. TEMCO shipped a total of 33 planes in the first two months of 1948, but reports orders in March, before month's end, already had exceeded any other full month's orders since the company bought the Swift last year. Appointments of W. A. Stone, Crystal River, Fla., and R. R. Millsap, Ft. Worth, as Eastern and Western sales representatives for the Swift, are planned to coordinate sales and service activities of the more than 50 Swift dealers in the country. Millsap formerly was sales manager of Southwest Aircraft, Inc., Ft. Worth, and earlier was associated with North American Aviation, Inc. Stone, a World War I pilot, previously had headed his own companies including W. A. Stone Co., Inc., Chicago, manufacturer of truck bodies, prefabricated houses and refrigerator cars, and Del-Air Corp., aircraft accessory plant in Florida. Both work out of Dallas.

BUSINESS PLANE TRAVEL RECORD—R. G. LeTourneau, manufacturer of earth-moving, hauling and lifting equipment, has established what is probably a new record for business plane travel during an equal period of time, flying in his "personal plane," a converted Douglas A-26 twin-engine bomber. Beginning with a Jan. 5 takeoff from Peoria, Ill., where the LeTourneau headquarters plant is located, the industrialist and his vice president and general sales manager, Roy E. McCluskey, logged 94 flight hours in the next 15 days, covering distances totaling 28,000 miles. The plane is piloted by a former AAF flyer, Barney Barnwell. During the two weeks period, LeTourneau visited each of his domestic plants, at Longview, Texas; Toccoa, Ga.; Vicksburg, Miss., and Peoria, and had held meetings with over 50 LeTourneau distributors in the U. S. and Canada, (2 hr. for each meeting). He also spoke at several scheduled meetings of civic and church groups. Cities visited included such widely separated points as Jacksonville, Fla., Seattle, Vancouver, B. C., Boston, Hartford and Ottawa, and three returns to Peoria during the period. Average ground speed for the flights was slightly over 300 mph. LeTourneau has been traveling by business plane for several years, using a Lockheed Lodestar for his personal transportation before he obtained and converted the A-26.

RENT-A-PLANE EXPANSION—Plans to establish branches of the Rent-a-Plane Co. at Wichita and Dallas have been announced from the organization's home office at Tulsa. Company is now operating five Beech all-metal four-place Bonanzas out of Tulsa on a rental and fly-your-self basis, and presumably will add some equipment to take care of the expansion. The Wichita and Dallas branches are the first of a series of planned expansions which eventually will cover the major cities of the southwest, Ralph Smith, manager, announced.

SCHOOL ORDERED CLOSED—Shelby County, Tenn., board of education has ordered closing of the Shelby County School of Aeronautics, Whitehaven, by July 1, because of need for additional space for school children. Space vacated by the aeronautics school, which has been conducting aviation instruction for approximately 170 veterans under the GI Bill of Rights, will be used for high school vocational training. Veterans have protested the closing. Date was set in accordance with VA contracts ending June 30.

VOCATIONAL RESOLUTION—Resolution recently offered by Rep. Joe L. Evins, (D., Tenn.) and referred to the House Veterans Affairs Committee, offers more hope to the GI flight school operators than any other Congressional "solution" yet proposed. Offered as Concurrent Resolution 177, the Evins bill declares that flight training courses offered to veterans under the GI Bill of Rights are "vital to both the advancement of civil aviation and promotion of national defense." Courses are declared to be "vocational in nature and in no sense avocational or leisure-time activity" and it is stated that participation by veterans in flight training should not be "curtailed or discontinued." House Veterans Affairs Committee reported last week that additional hearings on flight training would be held before proposed legislation is reported to the house for action.

READING MAINTENANCE PROJECT—Application by Reading Aviation Service, Inc., to lease major facilities at Reading, Pa., Municipal Airport, including nine large buildings, under a bid which would pay the city more than $30,000 a year, is expected to mean further development of an already large plane maintenance program there. Contracts are being sought with two international air carriers, and for servicing of all CAA planes in Region I. Staff of the organization is expected to expand from 65 to 125 persons when the contract is made, Alfred Bertolet, president, said.

—ALEXANDER McSURELY

Excellent Visibility Marks New Tandem

A rakish-looking new 90 hp. Luscombe two-placer, the first Luscombe tandem ever put into production, has received its CAA certification and is scheduled for first deliveries the last of this month. Price is $3195 flyaway Dallas.

Obviously designed in a bid for the two-place military liaison plane market, the new plane has been christened the Observer 90. It utilizes many parts of the standard Luscombe two-place Model 8 series, but incorporates a large transparent plexiglas canopy, and uses transparent plastic liberally in door panels and in sides.

Gene Norris, then the Luscombe chief engineer, gave an AVIATION WEEK editor a short local flight in the original Observer, an altered Model 8, last fall.

Plane has standard Luscombe 35 ft. wingspan, 19 ft. 11 in. length, is powered by 90 hp. four-cylinder Continental C-90 engine, and is equipped with the new Luscombe silflex landing gear. Price quoted includes starter, generator and lights.

▶ **Window Space**—Some idea of the unusually good visibility available in both pilot and observer positions may be gained from the fact that total window space is 33 sq. ft.

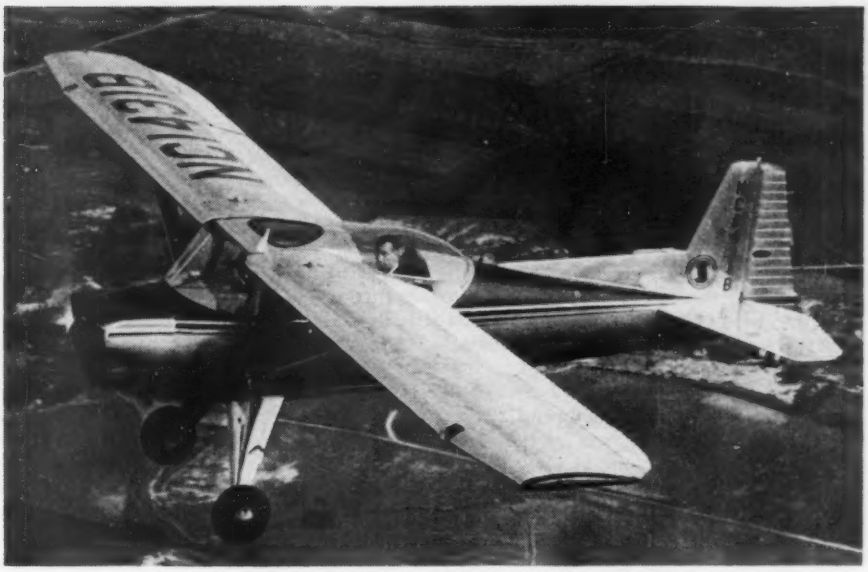
Accompanying photos show the plane on occasion of its initial flights after receiving NC. Herb Graham, executive secretary of the National Flying Farmers Association, had the first flight, while Luscombe officials including L. H. P. Klotz, president, H. G. Erickson, chief engineer, and Otto W. Hoernig, assistant to president, looked on. Chief test pilot Horace Scoggins was at the controls. Slim Kidwell, Central Airport, Los Angeles, is passenger in the flight picture.

▶ **Performance**—Plane speeds are similar to those of the standard two-place 8F 90 hp. Luscombe: around 128 mph. top speed, 115 mph. cruising speed, 850 ft./min. rate of climb, 17,000 ft. ceiling.

Tooling for the Observer is now under way in preparation for first deliveries at month's end.

Luscombe has never before had a tandem plane capable of ready conversion for military liaison work. In World War II, Stinson and Piper led the liaison plane makers, while Aeronca, Taylorcraft and Interstate also produced liaison planes in quantity. Since war's end, Aeronca and North American have shared contracts from the Army Ground Forces for off-the-shelf purchases of stock airplanes, slightly remodelled for liaison work.

Luscombe's new Observer 90 (Model T8F) has considerable potential use as a trainer, both in the 90 hp. version, and in less expensive lower powered models—in addition to the military contracts its availability may stimulate.



New Luscombe Observer in flight.

President L. H. P. Klotz demonstrates visibility.

Graham gets first NC ride.

LETTERS

Sixth Region Praised

To the Editor:

Relative to CAA inspectors, to date no comment has been made as to the splendid and deserving organization, the Sixth Region of CAA, which has been operating for many years in the benefit of aviation in general.

I have been associated with aviation since 1928 and up to 1936 I remember CAA inspectors with their pen knife and red tag inspections. But looking back over the many years, it appears that some of these hayseed operators needed a little cultivating and that was one way of doing it.

It is a pleasure to have CAA inspectors visit out airport on their regular itinerary periods. They have been most helpful, courteous and industrious and attentive to their duties at all times.

I regret it is utterly impossible to commend all CAA Sixth Region personnel who deserve honorable mention, but would like to add the following names of CAA personnel and inspectors with whom I have had contact. These men deserve praise for their honesty and recognition for their abilities and sound judgment in...advancement of aviation...

J. Marriott	B. Nacht
H. A. Hook	Tom Barber
A. Harold Bromly	Earl Mitchell
Jim Reed	Ross H. Johnson
Frank Allen	John Fouche
G. W. Hammond	Charles Worthley
W. A. Klikoff	George W. Haldeman
B. F. Mayhugh	R. E. Dake
F. Robinette	Dwight Petersen
Marshall Beeman	Homer Stamets
Al Lefevre	R. C. Boone
Merrial Grix	A. S. Ward
Leland Safford	E. L. Donahue
Forrest Rye	William A. Rysavy
Kent Davis	Robert Mabry
	John P. Waage

Thank you for your assistance...

CECIL R. REID, Manager
Reid's Hillview Airport
San Jose, Calif.

Navion Dealer Complains

To the Editor:

Your editorial ("Lightplanes Looking Up") cannot pass without realistic comments from a person who certainly feels your report is prejudiced and incomplete. Where the Ryan Navion excels, no mention is made of its superiority as you have endeavored to point out with Beech and Stinson.

Specifically, the Ryan Navion has incomparable roominess and visibility from both front and rear seats.

Postwar engineering effort and expense were undoubtedly greater in the Navion than any lightplane ever built. Subsequent modifications have not been necessary to any great extent due to sound basic design. For example, compare the landing gear and rugged construction with any other lightplane. It is questionable as to whether anything but tricycle gear can be considered postwar. Time will eventually prove other types obsolete as it has on commercial aircraft. . .The fuel system is new and is a major change. Few changes were needed other than have been accomplished by Ryan.

There must be a reason when the Army Ground Forces order 50 additional 2-17A Navions and plan further procurement. Since I spent seven years in the engineering department at Lockheed before securing the Ryan Navion dealership, I could not pass by your editorial without comment as the superior design features appear obvious to me.

JOHN B. RUDY
John B. Rudy Co.
Glendale, Calif.

(*A letter from Ryan Aeronautical Co. commenting on this editorial appeared in* AVIATION WEEK *March 29—Editor's Note*).

Travel Agent's Woes

To the Editor:

I have just finished your editorial of Feb. 16 ("You Can Be On Time") and hasten to tell you how thoroughly I approve. As a travel agent I often have the unpleasant job of trying to explain to a first-rider why her or his plane was late on arrival. It is extremely difficult for us to sell the dependability of airline transportation in face of the sloppiness of their operation in the past few years.

As a former airline employee I know how true it is that the "Big Boss" had to be there to guarantee an on-time flight...I fly many times each year...Nothing is more irritating than some of these ridiculous oversights. . . Recently, I took four personal friends to LaGuardia to board a NWA plane to Detroit. I will grant they boarded the plane on time but for the next hour and a half they sat in their seats at the ramp while a veritable army of men rushed to and from the ship with baggage, food, manifests...I was later told that during that long wait the passengers were advised nothing regarding the cause of the delay. I am only glad these four were friends and not clients I was trying to impress with the efficiency of the airlines. . .

We who have the middle man's job of interpreting the airline to the customer are completely behind your campaign for the elimination of these faults by the airlines.

JAMES A. CHAPIN, Vice President
The Ross Agency, Inc.
New Canaan, Conn.

Overnight Rates

To the Editor:

In your Feb. 16 issue under the column, "Briefing for Dealers & Distributors," I noted an entry that certainly brought a smile of cynicism. I refer to comment on the opening of the hangar at Boston's Logan airport by Inter-City Aviation.

One of my ships was caught in bad weather in Boston (in February) and forced to put up overnight. Unfamiliar with the field, the pilot wound up at Inter-City. The ship was a Piper Cub, and the next day the pilot was presented a bill for $4 for one night's storage.

Immediately adjacent is Wiggins Airways who charge $2 for the same service. People in aviation are tired of getting "the bite" every time they turn around.

I have written a letter to Inter-City, the Logan airport manager, and AOPA protesting the charge which I consider nothing but excessive. There doesn't appear to be much that can be done about it; however, competition is on my side and, I feel confident, will take care of the matter in its own way.

JOHN C. VAN ARDSDALE, Manager
Cape Cod Flying Service
Marstons Mills, Mass.

New Aero Department Urged for Rhode Island

Establishment of a new department of aeronautics has been recommended for Rhode Island by two firms of engineers engaged early this year to survey the state's aeronautical needs and map a program of development.

In preliminary reports, George Armstrong & Co., of New York and Thompson & Lichtner Co., of Boston, agreed that the state's present control of aviation is too diffused. They urged that all planning, construction and operation of state facilities be centered until the beginning of 1952 in the present Department of Public Works.

At that time, the reports say, a new Department of Aviation should be created and the operation transferred.

► **Many Cooks**—At the present time the Rhode Island Public Utility Administration, Planning Board, Port Authority and Commission on Postwar Programs all have an interest in aviation—in addition to the Department of Public Works.

One firm, the Armstrong outfit, also recommended that the state tax of 4 cents a gallon on aviation fuel be refunded to aircraft users. Legislation to do this has been introduced in the General Assembly.

A final and complete report from the consultants is due this month.

Buffalo Port Plans

Buffalo Marine Airport will be opened for public use in the near future if the city acts favorably on a proposed lease of the property to Bernard Bellario, 29-year-old former Naval flight instructor. Bellario plans facilities for private seaplane operation in addition to a flight instruction and charter business. Lease of the facilities located at the foot of Georgia St., Buffalo, is being studied by the airport advisory board.

Stockholm Letter:

Russia Eyes Air Bases in Sweden

Important facts missing as Soviet launches pressure campaign with a typical blast at Swedish commander Jung.

By G. HOWARD SMITH

Russian pressure on Sweden has started, typically enough, with a blast at the commander-in-chief, Gen. Helge Jung. According to Krasnij Flot, Red Navy organ, General Jung is demanding "increased numbers of officers and men, armed with American weapons, construction of new fortifications and airfields, and the mobilization of industry on a basis of strategic imports of military raw material from the U. S. A."

Where Sweden could buy arms, except in the West, the Soviet paper does not inquire. But a recent declaration by Denmark's Minister of Defense, Rasmus Hansen, is illuminating.

Russia was one of the first countries the Danes turned to, said Hansen, when they started to build up their defense again after the Nazi occupation. But the Danish purchasing mission was not allowed to enter Russia either then or on a later application.

Attempts at arms purchases in Czechoslovakia were no more successful. The Danes had no alternative, in fact, but get what they wanted from England, Sweden and the United States.

Nor does Russian propaganda tell its readers who is causing these Scandinavian countries, which so eagerly embraced the idea of the United Nations and One World, to look to their defenses in such a hurry just now. It booms away that the Swedish airforce is being "fused with that of the United States," and that the new fortifications and airfields in northern Sweden are for the use of American planes and airborne troops.

Many a Swede would feel happier if he felt that was true—or a reasonable possibility. Possession of the Scandinavian airfields by either of the opposing power groups would give it great advantages over the other, and there is a gnawing apprehension that Russia, being nearer and more prepared, may grab them first.

From Scandinavian airfields the range of fighter escorts either over Greenland and the Atlantic or deep into Russian territory could be increased by several hundred miles. Particularly tempting is Denmark. Although they have no air force themselves as yet, the Danes have kept up the numerous fields built by the Germans—and potentially the country is one big airfield, flat and treeless.

Clearly, however, the Russians cannot get hold of Denmark without bringing on a full-scale conflict. Both their propaganda and their moves in Finland hint a concentration on Finnish, Swedish and Norwegian Lapland. There they have their biggest fifth column in Scandinavia, and are wonderfully defended by natural obstacles from Western interference.

Only Sweden could offer them any initial military resistance. And how effective that could be no one knows. The soldier material is good, and most of the new generals have had some fighting experience in the Russo-Finnish Winter War.

The Swedish airforce looks good—and encouraging are plans to increase the number of planes by 50 percent, primarily by purchases from England. But Sweden's airforce lacks navigational aids, and cannot even approach airline standards for bad weather and night flying—a sobering weakness.

* * *

Meanwhile Communist activity is dealing a shrewd blow at Swedish air efficiency through the airlines strike, which is not only grounding all ABA planes, but preventing SAS machines being serviced at Stockholm. Now four months old, this strike shows little sign of ending. The strikers, particularly the mechanics, easily found other jobs, and financial support is available for the rest.

Two aims are achieved: the best service organization in Scandinavia is scattered, and valuable Swedish earnings of foreign exchange cut down. Similarities with the disastrous metal workers strike of 1945, also Communist inspired, and the effects of which are still felt in Sweden, are striking.

Opening of joint Scandinavian airlines services on this side of the Atlantic, scheduled for Apr. 19, will be marred by the absence of the main participant as a result of this strike—the only one the government-owned ABA company has had in all its 23-year existence.

The common schedule for the three Scandinavian airlines shows an imposing route network. Including the Atlantic routes flown since the end of the war by the original SAS consortium, points served reach all Europe as far as Kirkenes in North Norway (by the Russian border) and Warsaw in the east, south to Teheran and Nairobi—and Iceland, New York and Buenos Aires to the west. Extensions are planned to India (probably this fall), the Far East and Australia. On July 1 North Atlantic services will be increased to two daily in each direction.

* * *

The pattern for fusing SILA, the privately financed Swedish SAS participating company on the trans-Atlantic routes, with ABA is now clear. The chairman of the board, on which government and business will be equally represented, will be a government man—but private interests are safeguarded by the chairmanship of the all-important executive committee.

Consolidation of Sweden's civilian airlines will be practically complete with the sale of the only charter carrier of any importance, Skandinaviska Aero AB, to the new ABA organization.

Air Medicine Post Filled In Aviation Department

MELBOURNE—Appointment of a Superintendent of Aviation Medicine in the Department of Civil Aviation has been announced. For the past 25 years, medical officers of the Royal Australian Air Force have acted as medical assessors and advisers for civil aviation.

The new official will be responsible for physical standards of pilots, flight navigators, flight radio operators and flight engineers. He also will have to advise on maximum hours of duty in the air, conditions of employment, and other matters affecting physical welfare of air crews and passengers.

100 British Planes Added To Indian Air Force

NEW DELHI—Independent India's small air force is getting a shot in the arm with delivery of 100 Spitfire and Tempest fighters.

The planes are being moved to Bombay from Karachi where they have been based at RAF fields. Thirty-three are India's share in the partition of the former Royal Indian Air Force. The other 67 have been bought from surplus British stocks.

FINANCIAL

Western, TWA Annual Reports Show New Management Results

While Western's 1947 statement records steady progress toward financial stability, TWA's situation appears somewhat less favorable than before.

Interesting contrasts of achievement through changed managements can be drawn from the 1947 annual reports of Transcontinental & Western Air, Inc., and Western Air Lines, Inc. These two carriers installed new managements at about the same time, but results differ widely.

Definite progress is shown by Western with a vast improvement over its badly snarled financial condition of more than a year ago. TWA in its annual report on the other hand, reflects further deterioration in its financial affairs.

▶ **Progress at Western**—Western reported an operating loss of $665,000 for 1947, almost half of the $1,221,000 operating deficit shown for 1946. As 1947 depreciation amounted to $1,845,497, there was an actual cash build-up in the company's assets through normal operating results.

The largest gain, of course, was due to the sale of Route No. 68, Los Angeles-Denver, for $3,750,000 to United Air Lines. In addition to bolstering its capital position through the sale and realizing a net profit of $1,593,917 after taxes, the company avoided being placed in tenuous competitive position with this route segment. The subsequent route consolidation order for United gave that carrier direct entry into Los Angeles and it would have been too much of a match for Western.

▶ **Strengthened Working Capital**—The net result of all operations during 1947, enabled Western to improve its working capital position by about $6 million. As of Dec. 31, 1947, the company had a net working capital balance of $1,410,000 as compared with a negative balance of almost $5 million the previous year.

The clean-up in the financial picture was facilitated by a loan of $3,800,000 from the Reconstruction Finance Corp. This did not represent further debt but merely assisted in the liquidation of bank and other loans totaling $4,118,000.

Moreover, equipment and spare parts to the extent of $1,094,000 were purchased during 1947. More important, $1,903,000 was expended for the hangar and office building.

▶ **Commitments Cut**—Progress in other directions is apparent as well. Instead of having purchase commitments totalling about $9 million as of Dec. 31, 1946, such obligations have been cut down to $2,280,000 as of Dec. 31, 1947. The main reduction was in the assumption of the contract to purchase five DC-6's for $3 million by United Air Lines.

Final results of 1947 capital developments are reflected in the change in the net worth position of the company. Stated in terms of stockholder's equity, the common stock increased from $6.32 to $8.21 per share in book value as of Dec. 31, 1947.

▶ **New RFC Application**—Western is currently faced with the problem of financing the acquisition of its fleet of ten Convair-Liners. Significantly, the disclosure is made that applications are presently in process with the RFC to provide for the financing of this equipment. At present, a total credit of $4,500,000 is available, of which $3,800,000 has been drawn down. This equipment acquisition will entail a capital expenditure of about $2,280,000.

The narrative report itself is very informative and gives an interesting account of Western's progress, future plans and tangible steps taken to attain more profitable operations.

▶ **TWA Report**—In contrast, the TWA annual report for 1947 displays no creative planning with only bare financial statements presented.

The report briefly recites the general ailments peculiar to the rest of the industry and joins in the chorus for more mail compensation from the government.

The most significant accomplishment the TWA management chose for notation in its annual report was the decision to purchase 12 new Constellations. While this is important, its greatest significance probably lies with the seller, Lockheed Aircraft Corp.

▶ **Financial Results**—Of greater import are the financial results recorded by TWA during 1947, and its financial condition. A net operating loss of $6,823,730 was reported for last year compared to $14,924,904 for 1946. However, 1946 bore the brunt of extraordinary losses such as the grounding of the Constellations and a pilot's strike.

TWA was in an excellent competitive position late last year when the DC-6's were grounded. However, results appear to show that the company was unable to capitalize on this development to the fullest possible extent.

For comparative purposes, it is of interest to observe that 1947 operating losses for TWA's major competitors were: United; $4,839,093 and American, $4,520,683. In these two instances, carry-back tax credits reduced such losses by appreciable amounts. TWA, however, had exhausted all such credits during 1946.

▶ **Cash Loss**—Including various other charges and credits, TWA's net loss for 1947 came to a total of $8,079,761. As total depreciation and obsolescence charges came to $7,788,661, there was an actual loss of cash as a result of operations.

Additional capital was provided during 1947 by the sale of $10 million 2¾% convertible notes to the Hughes Tool Co. A footnote calls attention to a significant change in the character of these notes. On Dec. 26, 1947, the Hughes Tool Co. agreed to waive payment in money or in any way other than stock of TWA. The notes and accrued interest are convertible at any time prior to June 2, 1956, at the option of the holder at a price which will, for all practicable purposes, be close to the market.

The balance sheet shows very little improvement from the previous year. The same debts remain with additional ones created. Presumably, because of the extraordinary provisions of the convertible notes, this issue is included in the Capital Stock section. Without such addition, there would have been an actual deficit of $3,192,825 in the company's equity account.

▶ **Assets Value**—The current balance sheet further overstates the realizable value of a number of assets. It is possible that this condition prevails so that last year's losses would not have been further increased.

For example, 335,000 shares of TACA are carried at $2 per share. The market price of TACA is now less than $1 per share. Accordingly, this valuation is more than $335,000 in excess of what can be realized at the present time. Further, there are a number of intangible and deferred charges carried in the balance sheet which, if earnings permitted, would have been written off the sheet in material measures.

—Selig Altschul

DOMESTIC TRUNKLINE FINANCIAL RESULTS*

Carrier	Calendar 1947 Oper. Profit	Calendar 1947 Net Profit	Calendar 1946 Oper. Profit	Calendar 1946 Net Profit
American	$(4,520,683)	$(2,962,776)	$(667,463)	$(375,943)
Braniff	(1,236,768)	(1,148,761)	(176,105)	34,100
Chicago & So. (a)	(767,610)	(799,865)	(1,225,000)	(1,005,680)
Colonial (b)	(778,915)	(957,711)	(442,049)	(375,459)
Continental	118,988	100,458	(126,490)	17,939
Delta	(707,757)	(475,279)	(142,338)	(110,463)
Eastern (c)	2,622,744	1,259,196	7,980,553	3,504,643
Inland (d)	68,809	6,568	(58,476)	(41,776)
Mid-Continent	152,091	46,696	442,928	262,066
National (e)	(1,028,271)	(725,254)	972,087	753,183
Northeast	(1,243,354)	(1,303,681)	(46,441)	80,315
Northwest (h)	(1,627,374)	(953,756)	(70,101)	(52,985)
PCA	(1,921,844)	(2,624,453)	(2,401,535)	(2,550,710)
TWA (f)	(3,988,919)	(4,928,402)	(9,675,898)	(8,339,413)
United (g)	(4,839,093)	(3,774,366)	2,474,129	1,086,961
Western (d)	(664,509)	(945,333)	(1,221,000)	(943,000)
TOTALS	$(20,431,274)	$(20,193,287)	$(4,324,723)	$(8,014,446)

(*) Figures tentative in some cases. Parentheses indicate loss.
(a) Includes $41,000 loss on Havana route in 1947.
(b) Excludes $116,000 net loss and $91,000 operating loss on Bermuda route in 1947.
(c) Includes losses on Puerto Rican route.
(d) Inland results reflected in Western and not duplicated in totals.
(e) Excludes $140,000 net loss and $135,000 operating loss on Havana run in 1947.
(f) Excludes losses on international routes.
(g) Includes profits on Hawaiian run and losses on Mexican subsidiary.
(h) Excludes NWA's net loss of $187,000 and operating loss of $75,000 on Alaska-Orient route in 1947.

16 Domestic Trunklines Report $20,193,000 Deficit in 1947

Rising costs, DC-6 grounding and accidents contribute to record losses; Rickenbacker sees industry pushing out of red by next fall.

By CHARLES ADAMS

The domestic airlines hit bottom profitwise in 1947.

While the bulk of U. S. industry enjoyed the best earnings in history, the country's 16 certificated trunklines showed an aggregate operating loss of over $20,400,000 and a net loss of nearly $20,200,000. Only four of the 16 finished the year in the black.

▶ **Costs Soar**—Hit hard by rising costs, the DC-6 grounding and a series of widely-publicized accidents, the carriers' second year of deficits in the postwar period was far worse than the first. Revised figures place the operating loss for 1946—the first postwar year—at $4,324,000 and the net deficit at $8,014,000.

Airline executives thus far in 1948 have been cautious in predicting that the industry has turned the corner to better times. But on the basis of first quarter 1948 results, Eastern Air Lines President E. V. Rickenbacker declared recently that the worst is over and the industry generally should be out of the red by next fall.

▶ **Improvement Seen**—First financial results in 1948 show an improvement over the same period last year. TWA, which had an operating loss of $1,472,000 in January, 1947, and $1,719,000 in February, 1947, on its domestic routes, cut the deficits to $121,000 and $629,000 in January and February, 1948.

United Air Lines, which had an operating loss of $1,884,000 in January, 1947, had a deficit of $1,116,000 in January of this year. PCA's operating loss of $1,017,000 in January, 1947, compares with a $372,000 deficit in January, 1948. Much of the loss experienced by American and United in the first quarter of this year was caused by the DC-6 grounding.

▶ **EAL Profit**—Although its earnings were cut sharply, Eastern again made the best financial showing among the 16 domestic trunklines in 1947. The carrier's net profit of $1,259,000 compared with a profit of $3,504,000 reported in 1946.

Also in the black last year were Continental Air Lines with a $100,000 net profit, Mid-Continent Airlines with $46,000 net, and Inland Airlines with $6000 net. Largest net loss was TWA's $4,928,000, followed by United with a $3,774,000 net deficit and American $2,962,000 in the red.

▶ **American Exception**—Mail pay adjustments may pare down the record losses experienced in 1947. Only American has failed to ask for additional mail compensation to balance the increased cost of operation.

In comparison to the $20,431,000 operating loss in 1947 and the $4,324,000 operating deficit in 1946, the domestic trunklines showed substantial profits for the seven preceding years. Operating profit in 1945 was $33,981,000; 1944, $36,406,000; 1943, $27,433,000; 1942, $26,544,000; 1941, $7,392,000; 1940, $5,967,000; and 1939, $4,556,000.

American Reports Deficit for 1947

Desite the largest passenger and cargo traffic in its history, American Airlines last year experienced record operating losses of $4,520,683 and a net deficit of $2,962,776. Net loss in 1946 was $375,943.

Gross revenue of $81,731,000 in 1947 marked a new peak and represented a 20 percent increase over 1946. But operating expenses increased 25 percent to a record $86,252,000. Impact of inflation and increased volume of service resulted in a rise of about $15,500,000 in five items of expense alone—wages, depreciation, special training in connection with new equipment, gasoline, and maintenance parts and materials.

▶ **Traffic Gains**—In the face of declining travel on surface carriers, American's passenger traffic increased 9.9 percent last year, and cargo traffic gained 34 percent.

Delays in delivery of DC-6s and Convair-Liners, grounding of the DC-6s in November, accidents on other airlines, and unseasonable weather were major factors in depressing potential revenues. Load factors were down considerably from 1946.

▶ **Convair Service**—Training expense for institution of DC-6 service aggregated $1,172,000 last year. In 1948, there will be further training expense as 75 Convair-Liners are placed in service

starting late this spring or early in the summer.

Grounding of the DC-6s last fall reduced American's potential gross revenue for 1947 by an estimated $3,500,000. On the day they were withdrawn from service, AA's DC-6s were providing about 50 percent of the company's seat mile capacity.

▶ **Personnel Reduced**—Total expenditures for wages and salaries increased during 1947 notwithstanding a reduction in personnel from 14,266 at the beginning of the year to 12,130 last December. American noted, however, that there is indication of increasing efficiency in the fact that the company produced 499 seat miles per day per employe during the third quarter of 1947, compared with 359 in the third quarter of 1946.

American also improved its competitive position in the industry during 1947. It accounted for 24 percent of the domestic industry's passenger traffic last year compared with 22 percent in 1946. The carrier also handled 32 percent of the cargo traffic carried by the certificated airlines, compared to 30 percent in 1946.

President Ralph S. Damon told stockholders that many of the difficulties of the past two years will continue into 1948. But he declared there is every reason to be optimistic about the long-range prospects that are in store for the industry.

Freight Forwarder Plea Denied

CAB rejects proposed exemption with Member Lee filing strong dissent.

Two proposals which might have aided all-cargo carriers to develop additional traffic volume have been turned down by CAB.

By a two-to-one-margin, the Board refused to approve its own proposed section 292.6 of the Economic Regulations granting freight forwarders temporary general exemption from various provisions (including the certificate requirement) of the Civil Aeronautics Act. At the same time, CAB denied Railway Express Agency's bid for an individual exemption permitting it to act as an indirect carrier under agreements with noncertificated freight lines operating under Section 292.5 of the Economic Regulations.

▶ **Strong Opposition**—Both the freight forwarder and REA exemptions were as strenuously opposed by the certificated airlines as they were endorsed by the uncertificated all-cargo operators. Some independent freight carriers have stated they may be forced out of business if unable to utilize the traffic-generating services which are offered by these freight forwarders.

CAB's refusal to approve the freight forwarder exemption is in line with the Board's recent rejection of the proposed exemption for all-cargo carriers on the Pacific Northwest-Alaska run (AVIATION WEEK, Mar. 22). The Air Transport Association in both cases argued that CAB lacked the power under the Civil Aeronautics Act to promulgate broad exemptions.

▶ **Basic Questions Involved**—In turning down the freight forwarder exemption, CAB Members Oswald Ryan and Harllee Branch noted that 79 companies have applied for certificates or exemptions in the pending freight forwarder case, which is awaiting an examiner's report. They said establishment of a policy with respect to indirect carriers involves extremely important questions which should be answered only on the basis of the full record in the freight forwarder case. This latter proceeding, Ryan and Branch declared, is now being expedited.

CAB Member Josh Lee's dissent from the majority's conclusions on the freight forwarder exemption was sharply worded. He said the Board's failure to adopt proposed Section 292.6 is not consistent with the interests of the public at large.

▶ **Delays Hit**—Lee declared CAB has had nearly a year and a half to determine whether to exempt freight forwarders. He said the majority's denial of the exemption on the ground an examiner's report is soon to be issued in the freight forwarder case (and that the proceeding will be expedited) is tantamount to using the Board's own procedural delays as an excuse for not granting the relief requested.

"I doubt the Board's ability to treat the freight forwarder case with any great expedition," Lee stated bluntly. "Even if treated expeditiously, it will be many months before final decision can be expected." He pointed to recent reports by the President's Air Policy Commission and the Congressional Aviation Policy Board which stressed the importance of formulating basic policies on air cargo as quickly as possible in the interest of national security.

▶ **Retarding Effect**—Lee indicated rejection of Section 292.6 would have a retarding effect on development of the airfreight business. At present, Railway Express Agency is the only company authorized by the board to operate as an indirect common carrier, and REA's services are confined to express (freight is excluded) moving over the certificated airlines.

The certificated airlines during the past year have repeatedly expressed dissatisfaction with their arrangement with Railway Express Agency, and some already have canceled deals for using

NEW CAB MEMBER TAKES OATH

Harold A. Jones (right), Los Angeles attorney and former Marine Corps flyer, took his place on the Civil Aeronautics Board late last month after being sworn in by Rep. Carl Hinshaw (R., Cal.). A Republican, Jones will serve with CAB until Dec. 31, 1952, filling out the six-year term of Clarence M. Young, who left the Board last fall.

REA's services for international shipments. With the aid of Air Cargo, Inc., their own ground service organization, the certificated lines have said they hope similarly to dispense with REA's "middle man" activities domestically.

▶ **Test Period Asked**—In his dissent, Lee said the best way to determine whether freight forwarders are an asset or liability in the air cargo business is to permit them to function for a test period. He said data thus gained would be of far more value to CAB than the extensive and aging record in the freight forwarder case.

Without authority to operate as indirect common carriers, a large number of airfreight forwarders have collapsed in the past year. Some of those still in business claim to be "contract" forwarders, but ATA has asserted this designation often is merely a subterfuge to cloak illegal operations.

NWA Rebate Plan Minimizes Delays

About one passenger in 20 traveling Northwest Airlines' domestic system collected a five percent fare refund for arriving at his destination more than half an hour late between Mar. 15 and 21.

First week of NWA's new plan to recompense passengers for delays (AVIATION WEEK, Feb. 16) found the carrier operating 87 percent of its flights and arriving close to schedule on 90 percent of the trips. Of 1288 scheduled arrivals during the week, only 128 were over a half hour late.

▶ **Time Made Up**—Study of the late arrivals showed an estimated 80 percent were due to weather. Thus only 20 percent of the delays resulted from handling of the planes by NWA personnel. In many instances, flights that left airports late were put back on schedule by fast flying.

NWA officials state that passenger reaction to the innovation has been very favorable. In most cases, the fare rebate came as a complete surprise to the travelers. Meanwhile, the carrier is looking forward to improving its on-time record considerably as weather improves during the spring and summer.

TWA Loss Aggregates $8,079,761 in 1947

TWA showed an improved financial picture in 1947 as compared with 1946 but was unable to report a profit on either its domestic or international operations.

It had an overall net loss of $8,079,761 last year against $14,353,237 in 1946. About $5,000,000 of the 1947 deficit was attributable to domestic operations.

▶ **New Purchases**—Operating revenue from both domestic and international services increased to $78,521,000 in 1947 from $57,360,000 in 1946. Despite an unfavorable cash position, TWA was able to purchase—on a time-payment basis—twelve new Constellations costing about $15,000,000. The craft will go into overseas service this spring and summer, permitting older Constellations now flying abroad to be used on domestic routes.

Factors cited as contributing to the 1947 deficit were the inflation spiral, unfavorable political and economic conditions abroad, competition from foreign airlines, and operational adjustments required as a result of epidemics in the Middle East late in the year. Upward revisions in mail compensation may later trim the losses reported.

TWA's cost per available ton mile dropped from 43 cents in 1946 to 35 cents in 1947 on the domestic system, and from $1.19 in 1946 to 67 cents in 1947 on the international routes. Revenue passenger miles for all services increased from 852,998,000 in 1946 to 1,043,761,000 in 1947, but the passenger load factor dropped from 84.2 percent to 68.2 percent. *(See Financial, page 40.)*

"KEY PEOPLE"—When You Need Steel

Ryerson's function is not only to supply your steel, but to deliver it on time. From the moment the Ryerson switch-board flashes your incoming call until the steel is laid down in your plant, a corps of helpful, intelligent employees well-trained in the Ryerson "Immediate Steel" tradition are at your service.

The likeable young women at the switchboard, phone-order salesmen, dispatchers, crane operators, skilled warehousemen who cut, shear and shape stock sizes to fit your specification, truck drivers—all of them are key people at Ryerson—key people in your service, when you need steel!

In spite of shortages, we are putting forth every effort to serve all Industry to the best of our ability. Naturally, many sizes and certain products are out of stock. However, for the most part you can depend on Ryerson for immediate shipment of a wide range of steel products.

PRINCIPAL PRODUCTS

Bars—hot and cold rolled	Allegheny Stainless—
alloy steel	sheets, plates, shapes,
reinforcing	bars, tubing, etc.
Structurals	Tool Steel
Plates—	Wire, Chain
Inland 4-Way Floor Plate	Bolts, Rivets
Mechanical Tubing	Babbitt
Boiler Tubes and Fittings	Metal Working Tools
Sheets and Strip Steel	& Machinery, etc.

JOSEPH T. RYERSON & SON, INC., Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

RYERSON STEEL

Inter-City Passenger Travel, 1920-1947

(Passenger miles in millions)

	1920	1923	1929	1933	1940	1946	1947
Airlines	...	...	84	173	1,052	5,903	6,008
Rail Pullman	13,260	12,062	12,847	5,094	7,293	19,838	12,343
Total Class I Travel	13,260	12,062	12,928	5,267	8,345	25,741	18,351
Rail Coach	27,500	19,546	11,333	6,941	12,480	39,002	27,700
Class I Inter-city Motor Carriers	...	3,000	6,800	6,400	10,100	23,200	21,455
Total Rail and Bus	27,500	22,546	18,133	13,341	22,580	62,202	49,155
Total Common Carrier Inter-city Passeng. Miles	40,760	34,608	32,061	18,608	30,925	87,943	67,506
Class I Travel as % Total Inter-city	32.2	35.7	43.5	28.3	27.0	29.2	27.2
Air Travel as % Class I Travel	...	...	.6	3.2	11.4	23.0	32.7
Air Travel as % Total Inter-city	...	...	.2	.9	3.2	6.7	8.9

No Slump in Passenger Traffic

While rail and bus revenue mileage decline, airlines show increase and get bigger share of total traffic.

The airline may be losing money, but not passengers.

For 17 years, through periods of depression and prosperity, they have boosted their own revenue passenger miles and captured a steadily increasing share of total inter-city passenger traffic.

▶ **Others Slump**—The 16 U. S. trunklines showed only a very small gain in revenue passengers and revenue passenger miles in 1947 compared to 1946. But railroad and bus passenger business last year declined sharply.

The certificated trunk airlines flew 1.8 percent more revenue passenger miles in 1947 than in 1946, while railroad Pullman passenger miles decreased 37.8 percent. Rail coach passenger miles declined 29 percent, and Class I inter-city motor carriers showed a 7.5 percent decrease in passenger business.

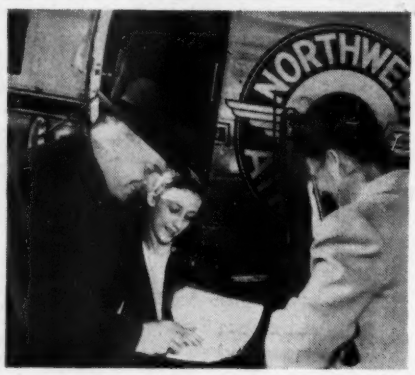
▶ **Share Increases**—From two-tenths of one percent in 1929, the airlines increased their share of inter-city passenger travel to 3.2 percent in 1940, 6.7 percent in 1946, and 8.9 percent in 1947, according to an Air Transport Association study.

In the major competitive battle between plane and Pullman, the airlines had 32.7 percent of the total business in 1947. This was a sizeable jump from the 23 percent in 1946, 11.4 percent in 1940 and less than one percent in 1929.

Rail Pullman passenger miles in 1947 totaled 12,342,560,000, compared with the trunk airlines' 6,008,122,000. In 1946 the airline figure was 5,903,114,000, and the rail Pullman total was 19,836,000,000.

▶ **Surface Travel**—Rail coach travel aggregated 27,700,000,000 passenger miles in 1947 and 39,002.000.000 in 1946; and Class I inter-city bus lines reported 21,455,000,000 passenger miles in 1947 against 23,202,000,000 in 1946. Total rail and motor carrier traffic last year was 49,155,000,000 passenger miles against 62,202,000,000 in 1946.

The ATA survey discloses that the average passenger haul on the domestic trunk airlines in 1947 was 490 miles. Average haul on U. S. overseas air carriers was 1377 miles and on domestic feeders 196.4 miles. In comparison, the average passenger trip by railroad coach was 83.1 miles last year, by Class I railroad Pullman 401.7 miles, and by Class I inter-city bus lines 47 miles.



AIRBORNE CANDIDATE

Harold Stassen, presidential aspirant, has taken to the air in his tours of the nation in search of delegates at the coming Republican national convention. Shown above giving autographs during a stop in Texas, Stassen has made three major swings around the country in recent months. He chartered planes from United Air Lines and Northwest Airlines for the trips. Stassen paid Northwest the standard DC-3 charter rate of $1 a plane mile. A desk and mimeograph machine were set up inside the plane, which frequently carried newsmen in addition to the candidate's aides.

92 ton feather

The U.S. Navy's Lockheed Constitution (big brother of the famed Lockheed Constellation) weighs 92 tons—twice as much as the average airliner.

Yet its five-ton, dual tandem landing gear is so finely articulated that the plane can land light as a feather.

So light, in fact, that there's a signal in the cockpit to inform the pilots when the prerotating wheels touch the ground during a landing.

The gear spreads the weight of the Constitution over such a large area that the airplane can operate from any normal CAA Class 4 airport without strengthening or lengthening of runways.

More than 50,000 engineering manhours went into Lockheed's development of the remarkable gear.

Such pioneering in design and research, in combination with resourceful production techniques, keeps Lockheed well in the forefront of aviation.

Lockheed Aircraft Corporation, builders of the U. S. Navy P2V Patrol Bomber, holder of the world's long-distance non-stop record (11,236 miles); the P-80 Shooting Star, the U. S. Air Force's standard jet fighter; and the Constellation, world's leading transport.

look to lockheed for leadership

Lockheed Constitution

Copyright, 1948, Lockheed Aircraft Corp.

Special Number for World Aero Buyers!

★ Containing important announcements by leading British Commonwealth Aircraft and Component Manufacturers

Every aero executive, designer and technician should obtain this important issue of Britain's authoritative air monthly. It contains, among other features, a survey of various aspects of British Commonwealth aviation; articles by distinguished airmen and technicians; special announcements by principal Commonwealth and Empire aircraft and aero component manufacturers; and many superb illustrations. Make sure of your copy by posting the Order Form below!

AERONAUTICS covers every phase of world aeronautical development. It is of superme value and interest to all engaged in aviation? Why not become a regular subscriber, beginning with this special number?

ORDER THIS BIG NUMBER NOW!

To: George Newnes Ltd., U. S. Subscription Office, 342, Madison Avenue, New York, 17, N. Y.
Please supply:
(1) *Aeronautics*, British Commonwealth Air Number, June issue.
(2) *Aeronautics* for one year, starting with June issue.

For June issue only send 75 cents. For Annual Subscription (12 issues) send $6.50.

I enclose remittance value.....

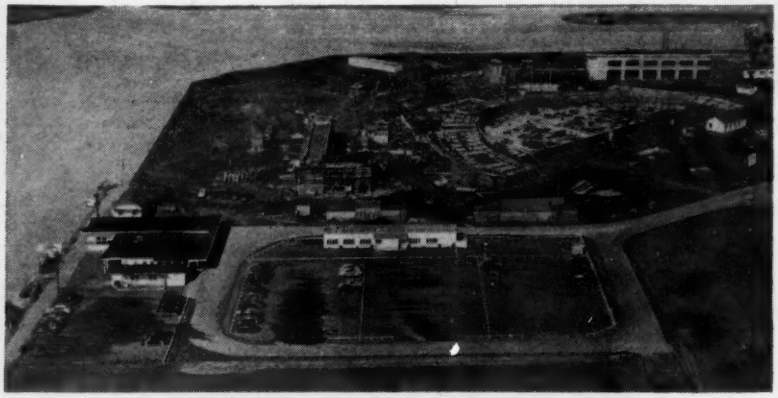
Name.....

Address .....

.....

....

AWJ 1948



CONSTRUCTION PROGRESS AT SEATTLE

With completion now scheduled for April, 1949, the new $2,500,000 administration building is taking form at the Seattle-Tacoma Airport. Model of the structure was shown in AVIATION WEEK, March 22. Aerial photo above shows the temporary administration building at lower left.

Town Meeting on Maintenance

ATA engineering conference draws 350 experts into discussion of problems created by use of new planes.

KANSAS CITY—New equipment has brought greater speed and greater revenue to airlines—but also maintenance headaches.

To discuss these problems, 350 airline, Air Force and Navy maintenance experts and equipment manufacturers turned out here for the three-day Seventh Annual Engineering and Maintenance Conference of the Air Transport Association.

▶ **Savings**—They exchanged operational service and overhaul experiences ranging from adjustment of distributor points to ground loading ramps. Frank discussion and free interchange of "fix" experience was worth millions of dollars in savings for usually competitive manufacturers and airlines.

The controversy between stainless steel and inconel for exhaust parts was debated energetically with final decision awaiting detailed service test now being planned by the Martin Co.

Rigidly mounted exhaust systems attached directly to the engine were advanced as a solution to ball joint difficulties, which now cost $21 per engine to replace at each overhaul. Douglas DC-6 and Convair-Liner both use a rigid exhaust system.

Water Injection—This equipment, not yet in commercial airline operation, brings corrosion problems, the conference heard. A solution of one and one-half percent soluble oil to the water-alcohol mixture was proposed to overcome this.

Ignition difficulties which center about the entrance of water and moisture into the magneto are responsible for upwards of one-half of the ground starting difficulties. Service reports on the low-tension system used on the Lockheed 749 Constellation show it is proving eminently satisfactory through its lowered susceptibility to moisture.

▶ **Way Out**—Most promising prospect—which may virtually eliminate ignition difficulties—is the General Electric low-tension, high-frequency breakerless system now under development. Transformer type spark plugs for use in this system have been developed by Champion and BG, and will be service tested.

A graphite coating system for spark plug electrodes, under development by Ralph Hall Co. and tested by Flying Tiger Line and North American Aviation on the P-82 Twin Mustang, shows promise of increasing plug overhaul periods from 100 to 600 hours.

▶ **Cleaning**—Exterior aircraft cleaning requires only 120 man hours per 1000 airplane hours, whereas interior cleaning requires up to twelve hundred man hours. This pointed up to the engineers the airline need for acid-resistant fabrics and materials.

New developments in the plastics field are rapidly overcoming this problem but lengthy service tests are required by the airlines before material commitments are made. Improved cleaners contain surface brighteners, wax coatings, corrosion preventers, acid resisters and other preparations now available.

▶ **Debate on Ground**—Ground service equipment problems produced heated debate. Air-frame manufacturers charged lack of airline coordination of requirements, forcing their virtual abandonment of the field to independent equipment manufacturers.

Airlines were divided on methods of

equipment specifications. Overseas operators leave discretion to local station managers. Domestic airlines favor their own engineering staffs for system specifications of standard equipment passenger loading ramps.

Baggage and cargo carts and utility wagons containing fluids, batteries and other aircraft service equipment proved controversial items on which agreement appears difficult. Result is a virtual standstill in this field.

▶ **Electrical Loads**—Pyramiding electrical loads on aircraft are multiplying maintenance problems due largely to continuing emphasis on light weight, to the detriment of dependable performance. Lightweight aluminum wiring, used on the Douglas DC-6, Convair-Liner and Boeing Stratocruiser, requires very close tolerances on connectors, placing an additional burden on maintenance personnel.

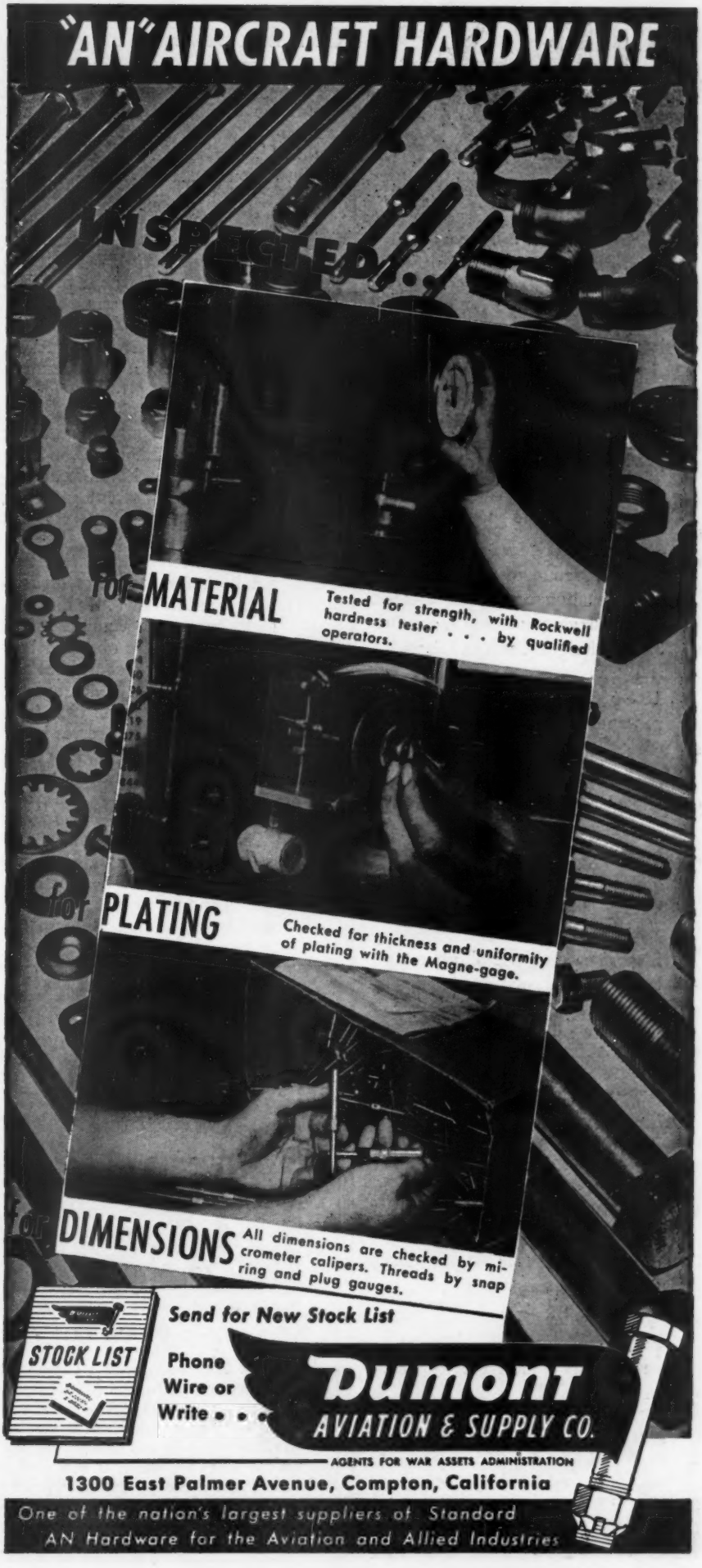
To ease this burden, personnel continually simplify the installations, such as using staked rathered than soldered terminals, free wire rather than filled ignition harness and the break up of manifold plugs (containing as many as 100 wires through a single plug) into a series of smaller plugs containing no more than 20 wires.

▶ **False Warnings**—Smoke detectors continue to malfunction. The results are false warnings that constitute a fire hazard since the pilot, having released the bottles, has no subsequent protection in the event of an actual fire.

Although the CAB insists that the Nov. 15 deadline for compliance with fire safety regulations will not be extended, airline maintenance men see no satisfactory smoke detection unit on the horizon by that time or even after. They view the photo-electric cell system as completely unworkable. Air Transport Association is in the process of creating a subcommittee on heating safety to carry into the future modification and re-design work now in progress.

▶ **Training**—Magnitude of the personnel training problem is seen in the annual airline expenditure of between $35 and $50 million for the purpose. United Air Lines has expended 50,000 man-hours on the DC-6 training program alone and estimates an expenditure of between $4 and $5 million annually. The scope of this problem, which is constantly expanding due to new equipment entering service, indicates the need for airline training on a national basis through an ATA subcommittee on training, soon to be formed.

▶ **Engine Overhaul**—Contract overhaul received extensive airing, with the airlines looking with increasing favor on this method for new engines—such as the Pratt & Whitney R-4360 Wasp Major—that will come into service this fall.


"AN" AIRCRAFT HARDWARE
INSPECTED...
for MATERIAL
Tested for strength, with Rockwell hardness tester . . . by qualified operators.
for PLATING
Checked for thickness and uniformity of plating with the Magne-gage.
for DIMENSIONS
All dimensions are checked by micrometer calipers. Threads by snap ring and plug gauges.
STOCK LIST
Send for New Stock List
Phone
Wire or
Write . . .
Dumont
AVIATION & SUPPLY CO.
AGENTS FOR WAR ASSETS ADMINISTRATION
1300 East Palmer Avenue, Compton, California
One of the nation's largest suppliers of Standard AN Hardware for the Aviation and Allied Industries

AIRviews

Opening up before us—air carriers and aircraft manufacturers alike—is a great revenue potential that has been slow in developing.

I'm speaking, of course, of the future in air cargo, as contrasted with passenger revenue. Only since the war have the vast opportunities in this field been approached realistically. There is still a long way to go.

Even today, for example, 95% of the revenue of all U. S. air transportation companies comes from carrying passengers; only 5% from freight. Contrast this with rail transportation, which gets 18% of its total revenue from passengers and 82% from freight!

Naturally, the flying of passengers will always remain a vital and glamorous part of our aviation picture. But there is reason to believe that the flying of cargo offers far more dollars and cents return.

What seems called for now is more careful over-all planning toward the successful handling of air cargo, and a long-range program for selling this service to management.

Cargo compartments of passenger planes and converted passenger planes must be replaced with aircraft specifically designed to handle cargo. Standard methods of tying down and loading and unloading must be devised. And fair rates established on a competitive basis.

In meeting and solving these problems, we here at Douglas stand ready to aid the air carriers in every possible way.

Donald W. Douglas

PRESIDENT
DOUGLAS AIRCRAFT COMPANY, INC.
SANTA MONICA, CALIFORNIA

C&S Shows Smaller Losses During 1947

Chicago & Southern Air Lines last year completed its return to a normal peacetime service pattern, concluding the expansion and reconversion program which was begun in July, 1946.

Although passenger traffic and load factors declined from the record levels of 1946, the company's 1947 deficit was substantially below that of the previous year. C&S had an operating loss of $767,610 and a net loss of $799,865 on its domestic and overseas routes in 1947. This compares with an operating deficit of $1,225,000 and a net loss of $1,005,680 in 1946.

▶ **Traffic Down**—Revenue passenger mileage last year totaled 112,564,000 against 137,843,000 in 1946. Load factor declined to 58.6 percent in 1947, down about 12 points from the previous year.

President Carleton Putnam said that had it not been for the series of accidents on other airlines in 1947, his company's 1946 passenger volume might have been sustained. He observed that crashes appear to affect a short-haul carrier more seriously than other airlines because the advantages of air over train travel between the points it serves is not so pronounced. During 1947, C&S completed its 11th year without a fatal accident.

▶ **Latin American Links**—Plans for extending Chicago & Southern's Latin American routes beyond Havana to Venezuela and Puerto Rico are still in suspension pending clarification of CAB's mail rate policies, Putnam declared. He stated that after informal conferences with the Board, and further surveys, C&S has been able to reduce its estimated mail pay need for activating the new overseas services. The company is hopeful of activating its link to Caracas, Venezuela, in the near future.

As a result of operating economies, C&S last year temporarily suspended various promotional and developmental efforts and re-equipment plans. The company's order for seven Martin 2-0-2s was cancelled in November, 1947.

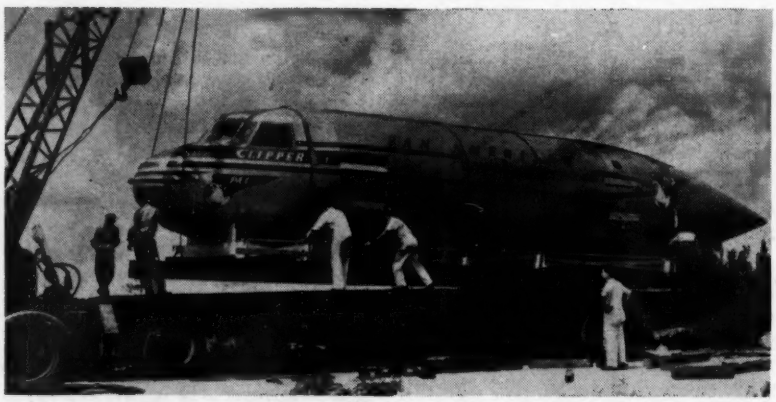
Personnel was cut from 2174 in October, 1946, to 1373 in January, 1948. Seat-mile costs were reduced from five cents in the last half of 1946 to 3.85 cents in the last half of 1947.

Colonial's Deficit Climbs To $1,074,341 in 1947

Colonial Airlines suffered a record net loss of $1,074,341 in 1947 compared with a deficit of $375,461 in 1946, but President Sigmund Janas sees better times ahead.

Janas told stockholders early this month that the losses for both years are overstated in that the company has not been granted permanent compensatory mail rates for services performed over its domestic system from April, 1946, through 1947. He attributed the high deficit last year to a combination of decreased public demand for service, the absorption of developmental expenses on the Bermuda route, and a continuation of the rapid rise in labor, material and overhead costs.

▶ **Better Days Ahead**—The Colonial president said that on the basis of first



PAA'S CONVAIR-LINER MOCK-UP

This wooden mock-up of a Convair-Liner fuselage, slightly smaller than the real thing, recently arrived in Miami by rail from the Consolidated Vultee factory in California. The $25,000 mock-up was transferred by truck from the Miami railroad yards to Pan American Airways' training center in Coral Gables. PAA pilots, co-pilots, stewards and stewardesses will be given a thorough familiarization course on the mock-up, which is equipped with regulation seats, a galley, an electrical system and a cockpit with a full set of instruments and controls. Actual flight training will get under way within a few weeks when Pan American takes delivery on the first of an order for 20 Convair-Liners.

quarter 1948 traffic he expects marked improvement in revenues this year. He expressed confidence that the air transport industry's problems of assuring safety and dependability are rapidly approaching solution.

Of the carrier's $1,074,341 net loss in 1947, $116,629 was the result of operations on the new Bermuda route. Service on the link began last August.

Revenue passenger miles flown by Colonial dropped from a record 45,592,000 in 1946 to 41,189,846 in 1947. Mail volume also declined, but cargo increased.

National Places DC-6s On Newark-Miami Run

National Airlines has returned its DC-6s to service, instituting daily, nonstop, four-hour flights between Newark and Miami.

Along with other carriers' DC-6s, NAL's four 58-passenger planes had been grounded since last November. Addition of a second daily Newark-Miami DC-6 flight with stops at Washington and Jacksonville is scheduled for Apr. 15.

Meanwhile, National's Washington attorney has taken issue with portions of the letter written by Frank P. Douglass, chairman of the National Mediation Board, to Senator Pat McCarran (D., Nev.) explaining the background of the current NAL pilot strike (AVIATION WEEK, Mar. 22). NAL Attorney William I. Denning said the wording of the letter indicated bias against the carrier.

Denning emphasized that successful arbitration in National's dispute with the pilots was in the offing last spring. But, he continued, David L. Behncke, president of the Air Line Pilots Association, rejected a neutral member of an arbitration panel which was to have complete power to settle the controversy. The present stalemate then resulted.

CAB Amends Section On Flight Recorder Rule

CAB has amended Section 41.24 of the Civil Air Regulations to permit scheduled air carriers to operate planes of less than 10,000 lb. maximum authorized takeoff weight in passenger and cargo service without installing flight recorders. The Board said construction of aircraft of less than 10,000 lb. maximum take off weight does not provide adequate protection for the recorder in the event of a severe crash. It added that the weight penalty imposed on smaller aircraft in relation to the useful load would be more severe than on larger transports.

DARNELL CASTERS

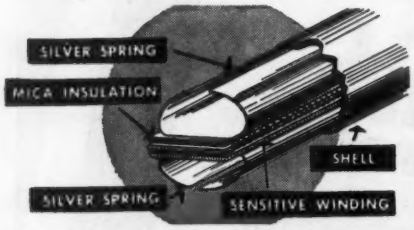
If you want maximum floor protection, economy and efficiency Demand Darnell Dependability...Made to give an extra long life of satisfactory service .....

DARNELL CORP. LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST NEW YORK 13 N Y
36 N CLINTON CHICAGO 6 ILL

Write Today for the new 192 page Darnell Caster and Wheel Manual

Why Are Edison AN Thermometer Bulbs Better?

they
- provide faster response
- permit higher operating temperatures than required by AN specs
- cost no more



Patented silver spring design permits faster heat transmission to sensitive windings and quicker response than required by AN specs. Springs also provide excellent cushioning against shock.

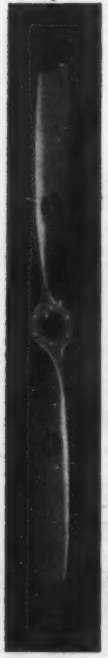
All-mica insulation, plus mechanical metal-to-ceramic seal in bulb header, permits higher operating temperatures than required by AN specs—up to 600° F.

Edison AN Thermometer Bulbs are now stocked for immediate delivery to meet your needs for replacement or entire new system installations.

Write today for new descriptive bulletin and prices on AN and other Edison Resistance Bulbs.

INSTRUMENT DIVISION
THOMAS A. EDISON, Incorporated
125 Lakeside Avenue • West Orange, New Jersey

MET-L-PROP ---- the HIGH-PERFORMANCE Propeller



FOR PERSONAL PLANES

• Fly like you've never flown before—with a McCauley Met-L-Prop. Get up and go with shorter take-off, faster climb and by far the best cruise.

Smooth, trouble-free, durable. CAA approved. You'll get the best flying performance with Met-L-Prop.

Now available for Stinson Voyagers, Cessna 170 and planes powered with Continental 65 to 90 HP engines. Soon available for other planes up to 165 HP. Write today for free, fact-full folder.

MET-L-PROP FORGED STRENGTH

Without Question — Met-L-Prop is best

See Your Dealer or Distributor Now

McCAULEY CORPORATION
DAYTON 7, OHIO

SHORTLINES

▶ **American Overseas**—Plans to increase trans-Atlantic flights from 15 to 20 roundtrips weekly effective May 1. Daily schedules will be operated between New York and London from May to September, and advance bookings are reported heavy.

▶ **BOAC**—Early this month made its 1000th trans-Atlantic crossing with Constellation aircraft. Company put the planes in service in July, 1946, and has averaged 23 passengers per trip.

▶ **British South American Airways**—British Ministry of Civil Aviation this week will open its formal investigation into the loss of a BSAA Tudor IV between the Azores and Bermuda early this year.

▶ **Colonial**—CAB has increased the carrier's temporary mail pay from the 20 cents a plane mile received last year to 35 cents a plane mile in accordance with the show cause order issued in March (AVIATION WEEK, Mar. 15). Company had asked for 50 cents a plane mile.

▶ **Mid-Continent**—Reports a $48,916 net loss in February compared with a $19,058 deficit in the same month last year. Operating revenues were up 19 percent, but the passenger load factor dropped from 60.2 percent in February, 1947, to 55.6 percent in February, 1948. Operating expenses rose 23 percent in February.

▶ **Florida Airways**—Was slated to inaugurate service to Perry, Fla., last week.

▶ **Pan American Airways**—Cargo volume on the Pacific-Alaska division increased from 116,245 lb. in February, 1947, to 333,373 lb. in February, 1948. In the Alaskan sector alone, the gain was from 23,994 lb. to 178,996 lb.—a 646 percent rise which was partly due to new commodity rates on northbound fresh meat and farm produce.

▶ **Pioneer**—Will offer all-expense vacation flights from Texas to points on its newly-certificated links in New Mexico.

▶ **Swissair**—Plane to make two roundtrips monthly between New York and Geneva during April, May and June.

▶ **Trans Caribbean Air Cargo Lines**—During 1947 showed a net profit of $61,061 on gross passenger and cargo revenue of $1,756,625. Carrier lost $21,164 in 1946 on gross revenue aggregating $791,434.

▶ **United**—Has shipped nearly 700,000 lb. of radio parts in and out of Philadelphia for the Philco Corp. in the past four months.

▶ **West Coast**—Terrain clearance indicators have been installed on the feeder's five 24-passenger DC-3s.

▶ **Western**—Has asked CAB permission to discontinue summer service at West Yellowstone, Mont., until improved airport facilities are available.

▶ **Willis Air Service**—Reports $7816 operating loss in January and $846 operating profits in February.

Subsidies Defended In House Report

The drive on Capitol Hill to clamp down on airline subsidies has been countered by a House Interstate and Foreign Commerce Committee report defending and minimizing government support to the air transport industry.

The Congressional group emphasized the extensive aid given other forms of transportation in the past. It opposed a separation of subsidy from service airmail payments.

▶ **Surface Funds**—Total government aid to the domestic air transport industry through 1941 was placed at $172,183,531, including $115,031,759 in airmail subsidies, $34,809,366 in airways services, and $22,342,406 in airport facilities. Net public aid to the railroads through 1941 was estimated at $111,386,783.

Government aid to water carriers in the form of river and harbor improvements totaled $2,138,756,000 through 1936, the report said. In addition, the committee pointed out that water carriers have benefited by over $1,000,000,000 in water terminal construction; and steamship lines between 1936 and 1946 have received a total of $282,000,000 in government subsidies.

▶ **Clash on Funds**—The committee took issue with attempts to compare the equities or inequities of government assistance to varicus forms of transportation. Each expenditure, it was maintained, must be considered on its own merits and in the light of the needs of the nation's transportation system.

"Whether the amounts spent in public aid or the manner in which they have been applied have been wise or unwise is of no present concern," the report stated. "What the Congress, the public, and the carriers should be interested in is the future development and maintenance of our national transport system in such a manner that it will always be capable of furnishing all the transportation the nation needs, of the quality it needs, at the lowest cost consistent with furnishing such service."

▶ **Claim Subsidies Justified**—Subsidies for air transportation, the committee asserted, "have been justified and may still be justified for limited periods because of the need for the initial development of new routes, and the introduction of new equipment into service for the advancement of operating speeds, and the like, ahead of what is immediately practical on an economic basis."

The committee emphasized the difficulties of separating subsidy payments from service payments to airlines for mail carriage—a proposition vigorously opposed by Air Transport Association on the grounds that the earmarking of government aid would furnish propaganda ammunition for surface carriers to thwart development of their airline competitors. The service charge, it was pointed out, would hinge on the allocation of post office overhead to the airmail service, "at best, a hazardous calculation." In addition, the committee wrote off as a virtual impossibility a fair and equitable decision on what should be considered a subsidy.

► **Defend Methods**—Defending the present method of establishing airmail payment rates reflecting both service and subsidy costs, the committee declared: "If the CAB properly discharges its statutory functions no mail subsidy accrues to the air carriers or their stockholders; the subsidy is rather to the service or community that fails to provide revenues commensurate with the costs assignable to that service, and a subsidy of that character exists wherever a carrier supports an unprofitable route or service on the basis of earnings accruing from another and more profitable service."

Meanwhile, both the investigating subcommittee of the Senate Committee on Expenditures in Executive Departments, headed by Sen. Homer Ferguson (R., Mich.), and the House Post Office and Civil Service Committee, headed by Rep. Ed Rees (R., Kans.), are continuing to gather background data on airline subsidization with a view to public hearings on the subject.

CAB SCHEDULE

Apr. 14—Hearing on Pan American Airways' application to acquire all property of Uraba, Medellin and Central Airways and for transfer of UMCA's certificate. (Docket 3272.)

Apr. 15—Prehearing conference on applications for new Southern Transcontinental services. (Docket 1102 et al.)

May 3—Oral argument in TWA-Hughes Tool Co. investigation, postponed from Apr. 1. (Docket 2796.)

June 14—Hearing on Capital Airlines (PCA) mail rate case. (Docket 484.)

TCA Cancels Contract

Trans-Canada Air Lines, acting on the advice of C. D. Howe, Dominion Minister of Trade and Commerce, has canceled its contract with Trans-Ocean Air Lines to fly immigrants from Great Britain to Ontario. No official explanation has been offered, although it is felt that inter-Dominion policies were a large factor.

Trans-Ocean carried its last load Apr. 1.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT : "OPPORTUNITIES" : EQUIPMENT
BUSINESS : : USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

60¢ a Line. Minimum 4 Lines. To figure advance payments count 5 average words as a line. *Positions Wanted* (full or part time individual salaried employment only) ½ the above rates payable in advance. *Box Numbers*—Care of publication New York, Chicago or San Francisco offices count as 1 line. *Discount* of 10% if full payment is made in advance for 4 consecutive insertions.

Individual Spaces with border rules for prominent display and advertisements.

The advertising rate is $9.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An Advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

PLANNERS

Tool and Production

Five years experience required

Company now expanding on F2H-1 Banshee Program

Write

McDonnell Aircraft Corporation

Lambert-St. Louis Municipal Airport

Box 516, St. Louis (3) Missouri

DAVE LEWIS 2606 Sharon Ave., Dallas, Texas

COMMERCIAL PILOT CAA #39191

TEST PILOT 7 YEARS

COMMERCIAL PILOT 9 YEARS

INST, SEL, MEL, SES RATINGS

OVER 5000 CIVILIAN HOURS

The Following Services Available

TEST WORK	COMMERCIAL WORK
Prototype Flights	Executive XC
Production Flights	Charter
Evaluation Flights	Ferry
Experimental Work	Special Work

DELUXE TWIN CESSNA FOR CHARTER USE

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

AERONAUTICAL ENGINEERS

This is your opportunity to become associated with one of America's outstanding aeronautical companies. If you feel that your present connection does not offer maximum opportunity for expansion, here is your chance to go places in aviation. The Glenn L. Martin Company has available a number of excellent positions and it will be well worth your while to investigate these opportunities further.

AERODYNAMICISTS — Excellent opportunities for aerodynamicists with college degree and 5 years experience. Interesting positions in research for men experienced in wind tunnel, development aerodynamics and Pilotless Aircraft proposal work.

VIBRATIONS ENGINEERS—Career positions are available for experienced men in the field of aircraft vibration, flutter analysis and dynamic tests.

For personal interview in New York City, contact the Glenn L. Martin Company representative at the Hotel New Yorker, April 13, 14 or 15.

THE GLENN L. MARTIN COMPANY

Baltimore 3, Maryland

POSITIONS WANTED

COLLEGE INSTRUCTOR — mechanical and aeronautical engineering. Desires position with opportunity to do doctorate work in mechanical or aeronautical engineering. Six years total industrial and teaching experience. Available by fall semester. Full information gladly sent on request. PW-4144, Aviation Week.

PILOT, AIRLINE Transport Pilot rating, 2700 hours, 2400 multi-engine, desires position as company or personal pilot. Experienced with most executive-type aircraft. College graduate, ex-AAF major, single, age 28. PW-4532, Aviation Week.

INDUSTRIAL ENGINEER—1947 M.I.T. Grad., B.S. degree; desires position having emphasis on methods work with an airline which is taking the initiative in new air cargo developments. Arnold Robeck, 2322 E. 69th St., Chicago 49, Ill.

EXPERIENCED ENGINEER-Pilot available for position on West Coast. Has B.S. degree in aeronautical engineering—one year aircraft design experience in widely known company—3 years military flying in multi and single engine planes. Detailed information sent upon request. PW-4513, Aviation Week.

FOR SALE

Wasp R985-19 engines

no time since first Army overhaul, total time approximately 600 hours each. Preserved, packed in pliofilm and crated for shipment complete with records, carbureter, magnetos, baffling and shielding. Will ship subject inspection and approval. Excellent values at $650. Anderson Aircraft Co., 1700 Sawtelle Blvd., Los Angeles 25, Calif.

For Sale. Licensed TG 1-A

two place sailplane with instruments. Also trailer and tarpaulin. Ideal for club and individual use. Write: Purdue Glider Club, Purdue Memorial Union, W. Lafayette, Ind.

FOR SALE

Grumman Widgeon

Excellent condition, purchased new July 1944, airframe time 1350 hours, left engine 10 hours since overhaul, right engine 215 hours since overhaul, metal propellers. For further details contact S. P. Gilley, Union Oil Company of California, 1134 Commerce Building, Houston, Texas.

SCHOOLS

Rising Sun SCHOOL OF AERONAUTICS
ESTABLISHED 1930
"Built Upon the Success of Its Graduates"
GOVT. C.A.A. and VETERANS APPROVED
ENROLL NOW FOR NEXT CLASS
Write for Illustrated Catalog
2206-16 E. HUNTINGDON ST., PHILA., PA.

We sell the Aircraft Industry throughout America

WE ARE HEADQUARTERS

FOR

AIRCRAFT HARDWARE

Just received an additional several hundred thousand dollar inventory

AN NUTS & BOLTS

NOTE: This is one of the most complete AN nut & bolt inventories in the West.

Large Stock Screws and Standard

- SUBSTANTIAL DISCOUNTS beyond regular replacement costs
- PERPETUAL INVENTORY MAINTAINED
- IMMEDIATE SHIPMENT from our warehouse
- ALL MATERIAL NEW, PRIME and unconditionally guaranteed
- CURRENT LISTS FURNISHED upon application

INDUSTRIAL MATERIALS CO. OF AMERICA

420 EAST 8TH STREET, LOS ANGELES 14, CALIFORNIA

CALL DEAN LUCAS AN HARDWARE SPECIALIST TRINITY 3225

BOOKS

AIRPORTS

CAN PAY THEIR WAY

Charles A. Zweng's new book, AIRPORT OPERATION & MANAGEMENT, contains scores of workable ideas for increasing airport revenues. A practical, detailed guide for both the airport operator and the student of airport problems.

312 pp. Illus. $4.50

Other Recent ZWENG BOOKS

PARACHUTE TECHNICIAN: Construction, operation, inspection, maintenance $3.00

ZWENG AVIATION DICTIONARY: 16,000 aeronautical terms fully defined $6.00

FLIGHT ENGINEERS MANUAL: a thorough preparation for the new CAA engineer rating $4.00

NEW CIVIL AIR REGULATIONS: simple, convenient guide to the latest pilot rules. $1.00

Write for free catalogue.

PAN AMERICAN NAVIGATION SERVICE

12021 Ventura Blvd. AW-1, N Hollywood, Cal.

AIRCRAFT SUPPLIES

FOR SALE

- $2,600,000 DOUGLAS DC-3, DC-4, A-20, CONSTELLATION, RYAN & OTHER AIRPLANE PARTS.
- $2,000,000 P&W, WRIGHT, SCINTILLA, ECLIPSE, BENDIX, PESCO, HAMILTON, THOMPSON & OTHER ACCESSORIES & PARTS.

REPRESENTATION

—also—

Special Agents for Leading Aircraft Parts Suppliers

TECHNICAL SERVICE

FOR SALE

- $200,000 C-54 TO DC-4 CONVERSION MATERIAL
- $400,000 AN HARDWARE.
- ★ *OUR DISCOUNTS EXCEED MANUFACTURER'S MAXIMUM*

Industrial Associates

PROMPT ATTENTION TO REQUESTS FOR QUOTATIONS, CATALOGS & INFORMATION

ADDRESS INQUIRIES: *Suite 205 357 South Robertson Boulevard Beverly Hills, California*

CABLE: INDASSO

A ROYAL WELCOME

Whether we're taking care of kings (King Michael of Romania has been flying with us lately) or movie stars (we recently did a complete radio job on Robert Taylor's twin-Beech) or YOUR aviation service needs, there's only one high standard of ATLANTIC service and courtesy. There's a royal welcome for all at our modern Teterboro base, 25 minutes from Times Square.

Atlantic Aviation CORPORATION

TETERBORO AIRPORT TETERBORO, N. J.

PHONE: HASBROUCK HEIGHTS 8-1740

FOR SALE

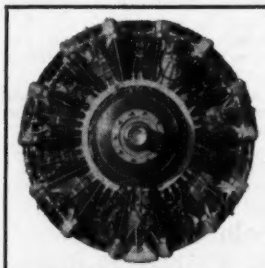
DC-4 (C-54B)

2—DC4 (C-54B) Airplanes combination cargo and passenger complete with all accessories now in regular service ready for immediate delivery

Code "Ard"

ALASKA AIRLINES, INC.

501 Fifth Avenue New York



the steward-davis 100-hour warranted

R-1830-92

Conversion...

$1795 f.o.b. Los Angeles

STEWARD-DAVIS • 13501 S. WESTERN GARDENA, CALIFORNIA • Cable STEDAV

GENERAL MAGNESIUM FOUNDRIES, INC.

612 South Third Street Belleville, Illinois

MAGNESIUM CASTINGS

"AIRCRAFT SPECIALISTS"

U. S. A. F. CERTIFIED HEAT TREAT FACILITIES

ADVERTISERS IN THIS ISSUE

AVIATION WEEK—APRIL 12, 1948

Adams Rite Mfg. Co. 53
Agency—The Shaw Co.

Adel Precision Products Corp. 25
Agency—The McCarty Co.

Ambrose Aviation Co., Frank 53
Agency—Steedle, Rankin & Boyle, Inc.

Bendix Aviation Corp. (Products Div.) 33
Agency—MacManus, John & Adams, Inc.

Chicago Pneumatic Tool Co. 8
Agency—G. M. Basford Co.

Cities Service Oil Co. 10
Agency—Ellington & Co., Inc.

Curtiss Wright Corp. .....Front Cover, 5
Agency—Charles Dallas Reach Co., Inc.

Darnell Corporation, Ltd. 49
Agency—Henry L. Rhea Adv. Service

Douglas Aircraft Co., Inc. 48
Agency—J. Walter Thompson Co.

Dumont Aviation & Supply Co. 47
Agency—Jordan & Lo Buono Adv.

Edison, Inc., Thomas A. 50
Agency—The Schuyler-Hopper Co.

Foote Bros. Gear & Machine Corp. ....Back Cover
Agency—The Buchen Co.

General Controls Co. 26
Agency—The McCarty Co.

International Nickel Co., Inc., The 9
Agency—Marschalk & Pratt Co.

Kidde & Co., Inc., Walter 3
Agency—Newell-Emmett Co.

Lockheed Aircraft Corp. 44, 45
Agency—Foote, Cone & Belding Adv.

Marquette Metal Products Co. .....Second Cover
Agency—Belden & Hickox Adv.

McCauley Corp. 50
Agency—Hugo Wagenseil & Associates

Micro Switch Corp. .....Third Cover
Agency—Hamilton Adv. Agency, Inc.

Newnes, Ltd. 46
Agency—W. H. Emmett, Ltd.

Ohio Seamless Tube Co., The 21
Agency—Howard Swink Adv. Agency

Pacific Airmotive Corp. 27
Agency—West-Marquis, Inc.

Roebling's Sons Co., John A. 4
Agency—Beatty & Oliver, Inc.

Ryerson & Son, Inc., Joseph T. 43
Agency—Aubrey, Moore & Wallace, Inc.

Searchlight Section 51, 52

Sherwin-Williams Co., The 31
Agency—Newell-Emmett Co.

Texas Company, The 6
Agency—Buchanan & Co., Inc.

Weber Showcase & Fixture Co., Inc. 22
Agency—Harrington, Whitney & Hurst Adv.

Westinghouse Electric Corp. 28, 29
Agency—Fuller & Smith & Ross, Inc.

■

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT
Positions Vacant 51
Positions Wanted 51
SPECIAL SERVICES
Contract Work 52
Repairing 52
EDUCATIONAL
Books 52
Schools 51
PLANES—EQUIPMENT
(Used or Surplus New)
For Sale 51, 52

WORLD-WIDE distributors of multi-engine transport type aircraft, engines, their components and accessories. Agent for WAR ASSETS ADMINISTRATION. Write, wire or telephone your requirements.

EXPORTERS AIRCRAFT-ENGINES COMPONENTS

FRANK AMBROSE AVIATION COMPANY

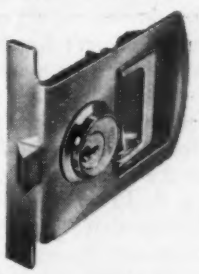
39-01 Main Street, Flushing, L. I., N. Y. . . . Cable Address: AIRAMBROSE
Branch Warehouse: Oakland Municipal Airport, Oakland, Calif.

Agents for Frank Ambrose Aviation (Canada) Ltd., Dorval Airport, Montreal, Canada and Frank Ambrose Aviation, S. A., Panama City, R. P.

Established 1923 *U. S. Export License No. 191*

COMPACT STRONG *Light-weight*

ARE You seeking a better lock . . . a latch with greater compactness and lighter weight —to fit a new product design? Product engineers recognize the advantages of custom engineered lock design by ADAMS-RITE. For nearly a half century ADAMS-RITE have been so serving industry. What could be more worthy testimony of the value of this service than the knowledge that ninety per cent of today's larger aircraft use ADAMS-RITE locks and latches. Engineering assistance in your special locking device problem is yours for the asking.



QUALITY HARDWARE
FOR NEARLY A cr HALF CENTURY

ADAMS-RITE MANUFACTURING CO.

540 WEST CHEVY CHASE DRIVE, GLENDALE 4, CALIFORNIA, U. S. A.

EDITORIAL

The Betrayal of Air Power II

The Truman-Forrestal-Marshall betrayal of air power smacks of archaic policies that wrecked Germany and Japan. It is a policy that could lead even the United States to defeat.

Survival of the 70-group Air Force program is a matter of U. S. survival. The President has been told so by expert advisers of his own selection. These he ignores.

So we have Defense Secretary Forrestal called back on the Congressional carpet to explain, if he can, why the Administration plumps for a 55-group Air Force. Mr. Forrestal, apparently concerned with how to keep at least two of his three secretaries happy instead of only Mr. Symington, brazenly contends it will cost fifteen billion dollars just to increase the Air Force from 55 to 70 groups. The other day he told the same audience we could buy a complete new military program, including Army, Navy, and 55 Air Groups, for fourteen billions.

No wonder Congress casts a fishy eye at Mr. Forrestal.

He says we must have a balanced team—a strong Army and Navy "to support the Air Force." He has stubbornly contended ever since unification that dollar equality for all three is his policy. Maybe this was part of the price the Navy asked for consenting to unification. We think there's a gimmick here somewhere which hasn't come out into the open yet.

Because dollar equality is ridiculous in its artificiality. Its false premise is that the next war will be scattered evenly over land and sea, or that each arm will be utilized exactly as much as the other. It ignores the unprecedented speed and mobility of air power, and air's independence of surface barriers.

Even this year the Air Force came off third best. The fiscal 1948 budget gave the Air Force 2.95 billion against 4.03 billion for the Navy and 3.21 billion for the Army.

Why, Mr. Forrestal, must we inflate the Army and Navy so much for those 15 more Air Groups? Are we going to be foolish enough to play into Russian hands by locating our air bases where they must be defended by huge ground forces? With the population differential of 140 million and 200 million do you expect us to compete with the Russians in divisions? Doesn't Russia have 100 divisions under arms at this moment? Our maximum in World War II was 90. Yet we won an air war with an efficient 2,000,000-man Air Force. Isn't it self-evident that a ground army can be built speedier than an air armada?

Look at the record of Mr. Truman's administration:

On Aug. 8, 1945, the President wrote the Secretaries of War and Navy that "it is vital to the welfare of our people that this nation maintain developmental work and the nucleus of a producing aircraft industry capable of rapid expansion to keep the peace and to meet any emergency."

On Oct. 11, 1945, the Air Coordinating Committee reported that an annual production rate of 3000 planes was necessary to keep the peace and a 5700 plane rate was necessary to meet any emergency.

In 1946 the annual military production rate was 1330. In 1947 it was about 1800. Appropriations for fiscal 1946 and 1947 could sustain production of only 60 percent of the ACC minimum for peace—3000 planes.

Now we come to the villainy.

For fiscal 1948 the military services stated their minimum needs as 3140 planes requiring $1,092,267,000 in procurement funds. The Budget Bureau, with Presidential approval, slashed this by 50 percent, eliminating 1629 planes and $448,327,000 in procurement funds.

In the interim serious studies of airpower were made by two other distinguished groups.

The President announced that his own Finletter Commission would seek to sift fact from fancy to come up with the best answer to the nation's air requirements. This group, recognized generally as probably the most capable ever to study aviation; wound up its deliberations by setting a 70 group Air Force as the minimum size of our national insurance policy. It urged that the Naval air force retain its present strength.

These recommendations were presented to the President at the White House amid flashing news cameras. Alas, the report has been gathering dust ever since in some White House cubbyhole assigned, perhaps, by Admiral Leahy. Meanwhile, Mr. Truman has been charmed by Messrs. Marshall, Steelman and Forrestal, demanding "harmony" in the National Defense Department to the exclusion of national welfare.

Next came the Congressional Aviation Policy Board, another distinguished group of patriots, who studied the same problem and made the same recommendation: A minimum peacetime Air Force of at least 70 groups; nowhere near combat needs. In the last war our Air Force reached a peak of 240 combat groups in action.

A third impartial and highly respected body, the President's own Air Coordinating Committee, described in the past as his top policy advisers on air, found it necessary in their annual report to Mr. Truman to sound another warning, reminding him that the President of the United States was throttling air power at Budget Bureau instigation.

The ACC pointed out that under changed conditions a 3000 plane production rate could no longer be considered applicable. Instead, a 5700 plane rate was needed. Yet, thanks to Truman budget slashes, the country did not even have a 3000 plane rate. It was less than 2000.

In the face of all this, the 1949 fiasco develops with air power held to a 55 group program while the Army and Navy are expanded.

We already have a Navy larger than all of the rest of the world's combined Naval strength, with three carrier task forces and twelve super carriers in service.

Our Army certainly needs building up, but not at the expense of Air.

The Administration now intimates weakly that it may ask for an air power boost next year, hinting that there are no suitable production types now available. It indicates it is better to wait for jets in 1950 than B-50s now.

How can it be drilled through brass hats into bureaucrat heads that any air expansion started now cannot possibly become effective until 1950 at the earliest? Neither industry now military planning authorities believe we can improve much on the 18 months gestation period which was required in the last war. How can the White House be told any better about the facts of life of an airplane?

If we want B-50s in 1950 we must decide today. If we want any jet bombers in 1950, we must start now.

The Truman administration is scuttling air power. It is up to Congress to act, decisively and quickly.

—ROBERT H. WOOD

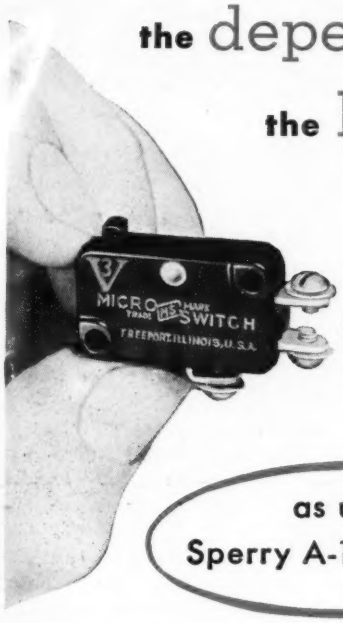
MICRO *Precision Switches*

have the precision...

the dependability

the long life

that the aviation industry can rely upon



as used in
Sperry A-12 Gyropilot*

MICRO...
first name in
precision switches

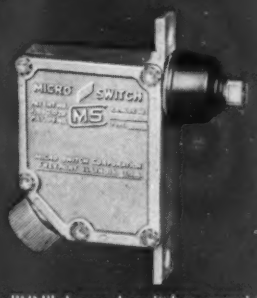
*Reg. TM

The V3-1 MICRO precision switch as used in the Sperry A-12 Gyropilot is suitable for use where limited space is available. It is enclosed in a plastic case and is light in weight. Terminals are heavy gauge brass with number 4 screws and lock washers.

D-C Ratings

28.5 volts, 6 amperes at 45,000 ft. altitude
28.5 volts, 10 amperes at sea level
Probable contact life . . . 25,000 operations

MICRO die cast enclosed switch is compact. It combines ruggedness with light weight and high electrical capacity.



MICRO Type "HN" housed switches provide a light-weight, compact, high-capacity switch with long life expectancy.

Selecting a switch to meet exacting requirements is made possible with the complete MICRO line. There are 3900 varieties of shapes, sizes, weights, actuators and electrical characteristics to meet all the varied requirements of design engineers.

Exact repeatability of operating point . . . long life and dependability are outstanding features.

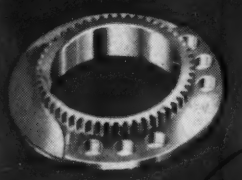
MICRO engineers are specialists devoted to solving switch problems. Their wide experience is a valuable aid that is at your service upon request.

© 1948 First Industrial Corp.

MICRO MS SWITCH
A DIVISION OF FIRST INDUSTRIAL CORPORATION
FREEPORT, ILLINOIS, U.S.A.

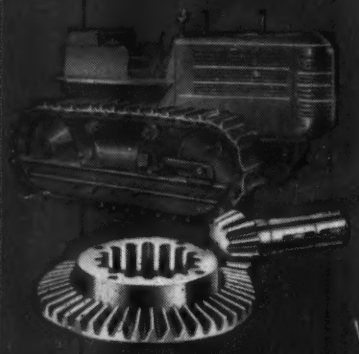
BRANCH OFFICES: CHICAGO 6, 308 W. Washington St.; NEW YORK 17, 101 Park Avenue; CLEVELAND 3, 4900 Euclid Avenue; LOS ANGELES 14, 1709 West 8th St.; BOSTON 16, 126 Newbury Street

SALES REPRESENTATIVES: PORTLAND, ORE., 917 S. W. Oak Street; ST. LOUIS 5, 6625 Delmar; DALLAS, TEXAS, Irwin-Keasler Bldg.; TORONTO, Ontario, Can., 11 King St.



WHATEVER YOUR NEEDS IN

GEARS



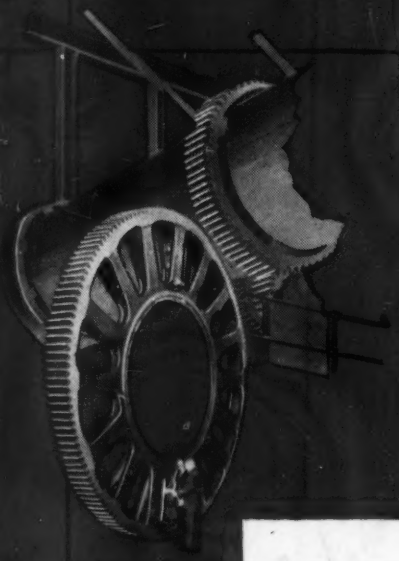
Do you manufacture gasoline or diesel engines—tractors or road building machinery—machine tools or, in fact, any type of equipment requiring gears? Then you should be familiar with the two large Foote Bros. plants completely equipped with the latest machinery for high speed, quality production of helical, spur, worm, bevel, or spiral bevel gears.

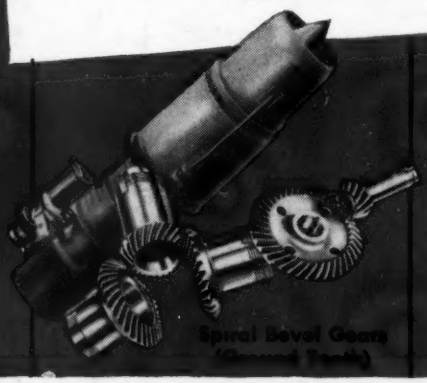
If you require giant gears twenty feet in diameter such as are used to drive ball mills, Foote Bros. has the equipment and experience to make them. If you need precision gears for use in aircraft engines, turbo jet engines, machine tools or a host of other applications, Foote Bros. can supply them. These "A-Q" (aircraft quality) Gears permit operation at extremely high speeds, assure greater efficiency, are compact, light in weight and quiet in operation.

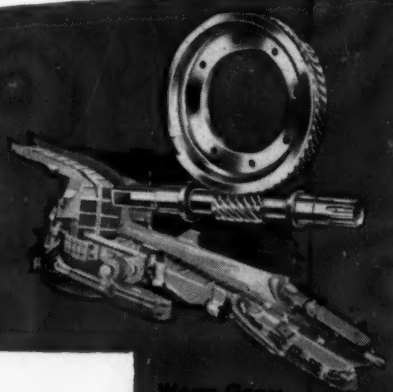
Foote Bros. also produces Actuators and Power Units to provide control or to transmit power; and Speed Reducers, either worm or helical gear types, in a wide range of ratios and sizes.

Regardless of your needs in power transmission equipment, Foote Bros. engineers can assist you in solving your problem.

FOOTE BROS. GEAR AND MACHINE CORPORATION,
Dept. AVW. 4545 S. Western Blvd., Chicago 9, Ill.







FOOTE BROS.

Better Power Transmission Through Better Gears